DOCTOR OF PHILOSOPHY

The Cultural, Organisational and Contextual Processes that Might Affect the Implementation of Massage in Lebanese Neonatal Intensive Care Units
A study Informed by Normalization Process Theory

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The Cultural, Organisational and Contextual Processes that Might Affect the Implementation of Massage in Lebanese Neonatal Intensive Care Units: A study Informed by Normalization Process Theory

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DECLARATION

I, Bahia Abdallah, hereby declare that I am the author of the thesis. Unless otherwise stated, I have consulted all the references cited. I have carried out the work of which the thesis is a record and the work has not been previously accepted for any higher degree.

Signature: Date

Bahia Abdallah

All conditions stated within the Ordinance and Regulations of the University of Dundee have been strictly adhered to and fulfilled by the candidate, Bahia Abdallah.

Supervisor's Signature: Date

ABBREVIATIONS AND TERMINOLOGY

AMTA American Massage Therapy Association

Attachment: the interaction between parents and children, biological or not, that develops during the first year they are together and is reinforced throughout life as described by Frank Bolton (Bolton, 1983).

BA Bahia Abdallah

BC Beirut City

BFH Baby Friendly Hospital

BSID Bayley Scales of Infant Development

BFHI Baby Friendly Hospital Initiative

BNBAS Brazelton Neonatal Behavioural Assessment Scale

BSN Bachelor of Science in Nursing

Bonding: A unique relationship between two people that is specific to birth and endures through time as defined by Klaus and Kennell (1976 p. 2)

C-SECTION **Caesarean:** Extraction of the infant, placenta, and membranes through an incision in the maternal abdominal and uterine walls.

CASP Critical Appraisal Skills Programme

CBJ Caroline Bradbury Jones, Thesis Supervisor

CI Confidence interval

CIB Coding Interactive Behaviour manual

COINN Council of International Neonatal Nurses

CRD Centre for Reviews and Dissemination

Early preterm birth: A birth delivered at less than 34 completed weeks of gestation.

ELBW Extremely Low Birth Weight: Birth weight <1,000 g

FCC Family-centred care

F Father

FG Focus Group

FBFH Formerly Baby Friendly Hospital

GHT Gentle Human touch: Placing one hand on infant's head & the other across lower back while infant is lying on its side or in prone position.

GA Gestational Age

GRADE Grading of Recommendations Assessment, Development, and Evaluation

GM Grandmother

HN Head Nurse

HCP Health Care Professionals

HW Heather Whitford, Thesis Supervisor

HWS Housewives

IAIM International Association of Infant Massage

Induction of labour: Initiation of uterine contractions by medical or surgical means for the purpose of delivery before the spontaneous onset of labour (i.e., before labour has begun).

IC Intermediate Care

ICN Intensive Care Neonates

IGF Insulin Growth Factor

IQ Intelligence Quotient

IR Integrative Review

ITT Intension to treat

IV Intravenous

KC Kangaroo Care

KMC Kangaroo Mother Care

KS Kinaesthetic stimulation**:** a passive exercise of the arms and legs

LBW Low birth weight infants: born weighing less than 2500 g.

Late preterm birth: A birth delivered at 34–36 completed weeks of gestation.

Light stroking: considered as a tickle stimulus (Scafidi et al., 1990)

LOS Length of Stay

M Mother

MDI Mental Development Index

MENA Middle East and North African region

MII mother –infant interaction

MIL Mother-in-law

MJ Martyn Jones, Lead Thesis Supervisor

MOA Mechanisms of Action

MOPH Ministry of Public Health

MPM Moderate pressure Massage

MIRU Mother and Infant Research Unit

MRC Medical Research Counsel

MSES Maternal Self-Efficacy Scale

MSN Masters of Science in Nursing

Multiple births: Births in twin and triplet and higher order multiple deliveries.

NBFH Not Baby Friendly Hospital

NICU Neonatal Intensive Care Unit

NG Nasogastric – usually as an intubation

NPO Nil per os: medical terminology for nothing through the mouth

NPT Normalization Process Theory

NVD Normal vaginal delivery

OBC Outside Beirut City

OPAC Online Public Access Catalogue

P Parent

PDI Psychomotor Developmental Index

PICO Population, Intervention, Control group, Outcome

PICP Propeptide of Type 1 Collagen

PIPP Preterm Infant Pain Profile

PN Practical Nurse

PO Per os: medical terminology for treatment taken orally

POPPY Parents of Premature babies Project

Preterm birth: Births delivered at less than 37 completed weeks of gestation.

PRISMA Preferred Reporting Items for Systematic Reviews and Meta-Analyses

PT Physical therapist

Pyd Pyridinoline

QA Quality Assessment

RCT Randomized Control Trials

RISS Rice Infant Sensorimotor Stimulation program

RN Registered Nurse

RQ Research Question

SIL Sister-in-law

SIGN Scottish Intercollegiate Guidelines Network

SSC Skin-to-skin contact; is defined as close contact between parent and infant. Generally, holding the infant naked with the exception of nappy in a prone position against the mother's (or father's) bare chest between the breasts. The infant will be warm from the contact as well as from blanket.

SBC Suburbs of Beirut City

STM Sensori-Tonico-Motor

TAC-TIC therapy: Touching and Caressing (TAC-TIC), the non-pharmacological intervention referred to as, Tender in Caring therapy was originally developed by Macedo (1983). It is a gentle and light systematic skin-to-skin therapy which is cephalocaudal in nature (i.e. the stroking moves from the head to the toes) and has been used in premature infants (Adamson-Macedo & Hayes, 1998).

TIMP Test of Infant Motor Performance

T/K Tactile/kinaesthetic stimulation

TPN Total Parenteral Nutrition

TS Tactile Stimulation

UOD University of Dundee

UOB University of Balamand

U.K. The United Kingdom

U.S. The United States of America

Vaginal Delivery: Delivery of the foetus through the vagina.

VLBW Very Low Birth Weight: Birth weight <1,500 g

Vestibular stimulation: cradled rocking, spinning hammocks, and oscillating waterbeds sometimes used in combination with massage (Korner & Schneider, 1983)

WBFH Working to become a Baby Friendly Hospital

WHO The World Health Organization

“If you can’t fly then run, if you can’t run then walk, if you can’t walk then crawl, but whatever you do you have to keep moving forward” – Martin Luther King, Jr.

"We are what we repeatedly do. Excellence, then, is not an act, but a habit." – Aristotle

“Endurance is not just the ability to bear a hard thing, but to turn it into glory” – William Barclay

ABSTRACT

Background: Care of premature infants is challenging for health care professionals. When the preterm infant is separated from its mother the parent-child interaction is impeded. In the last few decades, there has been increasing interest in the effectiveness of massage as an intervention to counter the negative physiological, clinical and behavioral consequences of prematurity and the neonatal intensive care unit environment.

Aims: To establish the effectiveness of moderate pressure massage from evidence in the literature and to then explore the cultural, organisational and contextual factors that may act as facilitators and/or barriers for its future implementation in Lebanon.

Methods: This thesis utilizes a two-step approach. Two literature reviews were undertaken to establish recent evidence on moderate pressure massage. A qualitative exploratory investigation was adopted as no articles were found that elucidated the contextual barriers and facilitators for massage implementation in the neonatal intensive care unit. The normalization process theory was used as a sensitizing framework to understand implementation issues and address the observed difficulties in implementing new interventions in clinical settings. This study was also concerned with context and culture as moderate pressure massage is not practiced in the Lebanese neonatal intensive care units. A purposive sample of Lebanese health care professionals and parents were recruited from three university hospitals with data generated through focus group discussions and observational notes. Framework analysis was used for the analysis and interpretation of the findings. The study drew on the principles and practice of ethnographic approaches.

Findings: The findings from the two literature reviews only revealed randomized control trials that observed mostly the short-term physiological and psychological effects of moderate pressure massage. There were no studies that examined the organizational and contextual issues that need to be understood before any trial could be designed in the neonatal intensive care unit setting. The evidence from this review suggested there is a need to explore the views of health care professionals and parents on the practice of massage in the neonatal intensive care units to provide insight into the

subsequent design of an intervention study that would be culturally sensitive, appropriate, and acceptable in practice. The findings from the qualitative study then revealed that despite the participants' interest in implementing massage intervention, parents' participation in the neonatal intensive care unit is almost absent except for breastfeeding. Participants in both groups, parents and health care professionals, highlighted the parents' fear and anxiety. In general, nurses are in charge and parents are passive observers. Transportation difficulties, unavailability of helpful staff, and fear were reported as major barriers to parent-implemented infant moderate pressure massage; health care professionals highlighted staff attitude and resistance, workload and time constraints. Communication, gradual implementation, encouragement and support were identified by parents as potential facilitators. In comparison, having extra staff and a protocol for teaching nurses, training parents and openness to innovation were the main potential facilitators of implementation identified by health care professionals.

Conclusion: This study helped to reveal the potential challenges of applying such a complex intervention as moderate pressure massage by the parents in the neonatal intensive care unit. Adopting infant massage in the Lebanese neonatal intensive care unit without preparation of health care professionals and parents would be premature. Good communication between parents and health care providers is a key element to facilitate early bonding and parent-infant interaction. Missing the opportunity to involve parents in neonatal intensive care unit care puts the family in a difficult situation to adapt to the new challenges after discharge. The findings of this study will advance current knowledge in understanding the factors that determine applicability, acceptability and feasibility of massage implementation in the neonatal intensive care unit setting. It will also assist and inform the design of future randomized control trials. The noramalization process theory was a valuable lens to guide the process of inquiry and to make sense of the emergent findings from this exploratory qualitative study.

Key words: massage, premature infant, neonatal intensive care unit, health care professionals, parents, implementation.

CHAPTER 1 : INTRODUCTION

1.1 Background

The incidence of preterm and LBW infants is increasing globally coupled with changes in maternal demographics and psychosocial stress (March of Dimes, 2009; World Health Organization (WHO), 2015). Preterm/LBW infants are at an increased risk of early growth retardation, developmental delays, short and long term disability and death (March of Dimes, 2009; WHO, 2009). Care for these infants is challenging for both health care professionals (HCPs) and parents due to the infant's critical health condition and the need for early and specialized care (Allen, 2008; Lau & Morse, 1998; Holditch-Davis, Cox, Miles, & Belyea, 2003; Melnyk et al., 2006). Due to technological advances, the survival rate has increased (Wilson-Costello, Friedman, Minich, Fanaroff, & Hack, 2005; Barros et al., 2010). However, these infants are often deprived of gentle human touch during this critical period (Anderson et al., 2003a). The infant is separated from his/her mother and kept in the Neonatal Intensive Care Unit (NICU) often for several weeks or months after delivery, resulting in detrimental physical and emotional outcomes for both infant and mother (Meier, Furman, & Degenhardt, 2007; Shapiro-Mendoza et al., 2006). During the first year of life, these infants are at risk of neurobehavioural and cognitive impairments (Delobel-Ayoub et al., 2009) compared with infants born at term (Behrman & Butler, 2007; Liu et al., 2007; Mathews & MacDorman, 2010; Neu & Robinson, 2010; Tuoni, Scaramuzzo, Ghirri, Boldrini, & Bartalena, 2012).

Family-Centred Care (FCC) and developmental supportive interventions, such as Kangaroo Mother Care (KMC) and Moderate Pressure Massage (MPM), have been proposed to minimize adversity and improve health outcomes for both Preterm/LBW infants and their parents. Massage as therapeutic touch has been suggested to counter

the infant's aversion to touch caused by negative noxious and/or painful stimuli, which also can be interpreted by their mothers as rejection (Stainton, Harvey, & McNeil, 1995).

In the last few decades, there has been increasing interest in the effectiveness of MPM as an intervention to counter physiological, clinical and behavioral consequences of prematurity and the NICU environment (Field, 2010a; Underdown, Barlow, Chung, & Stewart-Brown, 2010; Vickers, Ohlsson, Lacy, & Horsley, 2004). Infant massage as a tactile therapy involves positive touch which is thought to trigger many physiological changes by stimulating the nervous system (Vickers et al., 2004; Guzzetta et al., 2009). Several neonatal experts have argued that MPM could be a means to promote sensory development and parent-infant interaction and a way to encourage parents to be involved in the NICU and care for their infants (Ferber et al., 2005; Symington, & Pinelli, 2006).

The aim of this thesis is to review the evidence concerning the effect of the MPM intervention on the physiological, behavioural and psychosocial outcomes of preterm/LBW infants. Then with this informational base, to explore parents' and healthcare professionals' (HCPs) perceptions and attitudes concerning the factors that affect parent-implemented infant massage in NICUs in Lebanon. The chapter summaries will be presented next to outline the structure of this thesis.

Chapter one includes an introduction to infant massage with the implication of prematurity as a health concern, highlights the impact of the NICU environment on the preterm/LBW infant growth and development as well as parent-infant interaction and breastfeeding. Different types of massage are detailed aiming at establishing sufficient potential benefit for MPM and setting the stage to justify a systematic evaluation of its effectiveness in the literature. This chapter also examines the Lebanese health system in general and the NICU context specifically relative to the specific role of parents.

Chapter two provides a literature review divided into two parts critically evaluating the current evidence on MPM and the impact of massage on the short and long-term outcomes of infants as well as its impact on the parents. The first is a scoping review to synthesize the evidence regarding the effectiveness of MPM for hospitalized infants in the NICU. This provides a discriminating analysis of the quality and type of evidence that is available in the broader context and identifies important gaps that need to be addressed. This is followed by an integrative review to critically evaluate the current evidence of the facilitators and barriers in relation to the organisational and contextual issues when implementing massage techniques in the NICU. The chapter ends with a discerning discussion of the methodological gaps of the reviewed literature and an overall conclusion relative to the research questions.

Chapter three discusses the methodology and methods. First the research questions are laid out. Then the paradigms and philosophical assumptions that underpin the qualitative inquiry are discussed. An exploratory, qualitative study informed by ethnography philosophically underpinned by social constructionism was employed. This approach provided the most appropriate methodology to gain an in-depth understanding of the contextual and organizational factors that might affect the processes of massage application in a Lebanese cultural environment. Thereafter, the theoretical framework, the Normalization Process Theory (NPT) that underpins this study is highlighted and justified. Then the strategies to recruit participants to focus groups and generate data are discussed and the reasoning for choosing the Framework Analysis. The chapter concludes with a critical analysis of the data and a brief conclusion for the chosen methodology.

Chapters four, five, and six present a critical analysis of focus group findings informed by field notes, observations and personal reflections. Chapter four outlines the perceptions and attitudes of parents towards infant massage as a culturally acceptable

form of intervention, and explains the contextual and organizational processes that might hinder or facilitate its application in the NICU. It answers the research questions with data drawn from the parent focus groups, observational notes and field notes. Chapter five clarifies the perceptions and attitudes of the HCPs towards infant massage from the HCP focus groups, observational data and field notes. Chapter six identifies the similarities and differences of the two groups to gain a greater understanding of the Lebanese NICU culture. It also contrasts contextual and practical processes that might inhibit or facilitate the application of infant massage in the NICU in order to address the gaps in the current system in Lebanon.

Chapter seven presents a critical evaluation of the findings in light of the literature and NPT. This chapter provides an analytical discussion and critique of the implications of the overall thesis findings relative to the benefits and risks and then the barriers and facilitators conveying the complexity of potential implementation of massage in the NICU.

Chapter eight presents the conclusion summing up the findings. This final chapter presents the study's strengths and limitations and addresses the implications of the findings on education and practice, and then signposts avenues for future research.

1.2 Prematurity and LBW: Definition, Prevalence, Risk Factors, and Consequences

Preterm infants are those born at less than 37 completed weeks of gestation (WHO, 2009). LBW infants, weighing <2500 grams, can result from preterm birth, a small size for gestational age, or both (WHO, 2009). In 2010, an estimated 14.9 million infants were born preterm, being 11.1% of all live births worldwide, ranging from about 5% in several European countries to 18% in some African countries (Blencowe et al., 2012). Preterm birth occurs in 7% of all deliveries in the United Kingdom (U.K.), and it

has been reported at 12% to 13% of all births in the U.S. (Bhattacharya et al., 2010). In Lebanon it is estimated that 7.9% of all deliveries are preterm births (Blencowe et al., 2012), while LBW is at 11.5% (Central Administration of Statistics (CAS), 2009; El-Khoury, Kosremelli-Asmar, & Stephan-Yeretzian, 2012. The numbers above show that there is a notable difference in preterm birth rates between Europe and Africa; however, Lebanon although a developing country is closer to U.S. preterm rates. These rates suggest that Lebanon's risk factors are similar to resource rich countries and so their programs should be at the same level of support and care.

The majority of preterm infants worldwide are in the late preterm category (from 34 up to 37 weeks' gestation) (Engle & Kominiarek, 2008; Martin, Hamilton, Osterman, Curtin, & Mathews, 2013; Sather, Fajon, Zaentz, & Rubens, 2010; Walker, 2008). Late preterm has been reported at approximately 74% of all preterm births (Loftin, Habli, Snyder, Cormier, Lewis, & DeFranco, 2010). There has been an increase in the number of late preterm births since 1990 mainly associated with a change in maternal demographics such as higher maternal age at first childbirth (Martin et al., 2013; Loftin et al., 2010). Other factors affecting this number are related to infertility treatments, an increase in multiple gestations and Caesarean-section deliveries before 37 completed weeks of gestation and higher psychosocial stress as well as greater rates of the induction of labour (ACOG, 2007; Bettegowda et al., 2008; Badr, Abdallah, Mahmoud., 2005; Engle & Kominiarek, 2008; Fuchs & Wapner, 2006; Shapiro-Mendoza, 2006).

Both preterm and LBW infants account for 90% of neonatal mortality and 60% of overall infant mortality in developed countries (Fanaroff et al., 2007). Preterm birth is considered the largest single contributor to perinatal mortality, accounting for 75% of all foetal and neonatal deaths, and accounting for 27% of all direct causes of death, particularly for those deaths due to infection (Lawn, Cousens, & Zupan, 2005;

Lawn, Gravett, Nunes, Rubens, & Stanton, 2010; March of Dimes, 2009; Martin et al., 2013). LBW infants account for 60%–80% of neonatal deaths (Lawn, Cousens, Zupan, & Lancet Neonatal Survival Steering Team, 2005). In the U.S., 23% of all infants born at less than 1,500 grams in 2009 did not survive their first year, compared with less than 2% of infants born at 1,500–2,499 grams, and 0.2% of infants born at 2,500 grams and over (Mathews & MacDorman, 2013).

It is widely known that preterm/LBW birth results in short and long term impairment(s). Preterm infants often have immature organ systems, an immature central nervous system and fragile blood vessels resulting in a disruption of oxygen delivery to the brain. Repeated episodes of hypoxia and increased intracranial pressure can lead to complications such as intracranial haemorrhage and neurodevelopmental delays (McGrath et al., 2007).

The impact of prematurity and LBW on the infant's health varies considerably. It is estimated that 50% of preterm/LBW infants experience moderate to severe developmental delays and 33% require frequent hospitalization in infancy (Anderson, Doyle, & Victorian Infant Collaborative Study Group 2003b; Saigal et al., 2000). Developmental concerns as a result of brain injury in preterm/LBW infants have been well identified and include cerebral palsy (increased spasticity and decreased coordination of the extremities), sensory abnormalities, vision loss, hearing loss and learning disabilities in the first year of life (Beck et al., 2010; TeKolste, Bragg, & Wendel, 2004; Cornelieke et al., 2009; Petrini et al., 2009; Robertson et al., 2009, Arpino et al., 2010). Preterm birth also poses a financial burden on the health care system and family (Wang, Dorer, Fleming, & Catlin, 2004; Behrman & Butler, 2006). In the U.S. alone, it is estimated that hospital costs due to preterm births are 15.5 billion dollars per year (Field, Diego, & Hernandez-Reif, 2010b).

1.3 The Impact of the NICU on the Infant

Technological advances such as the support of ventilators have improved survival rates in those infants, however, an increased risk of chronic lung disease in addition to mental and physical impairments still remain (Moster et al., 2008; March of Dimes, 2009; Pulver et al., 2009; Hunt, 2011; Salihu, Salinas-Miranda, Hill, & Chandler, 2013). Exposure to acute periodic stressful events and interventions in the NICU may also negatively impact the infant's growth and neurodevelopment as another cause of short and long term disabilities and cognitive impairments (Delobel-Ayoub et al., 2009). Infants in the NICU are exposed to highly stressful extrinsic factors such as increased noise and lighting levels and painful tactile experiences for days or weeks (Badr et al., 2010). Also, they are often subjected to vigorous invasive and intrusive examinations and treatments in response to acute medical needs that may bring pain such as oral or nasal intubation, tracheal suction, catheters, tubes and needle punctures (Hunt, 2006). These infants are at risk of an increased sensitivity to pain compared to older children as a result of their underdeveloped neural inhibitory mechanisms and immature neuromuscular systems (Duhn & Medves, 2004; Als, 1986; Mefford, 2004; Allen, 2008; Bouza, 2009; Slater et al., 2006; Mountcastle, 2010). Pain is exhibited by distressed body language such as finger splaying, worried looks, rigidity in arms and legs or physiological responses such as an increase in heart rate, respiratory rate and/or blood pressure, variability in intracranial pressure, and a decrease in transcutaneous oxygen saturation levels (Als, 1986; Duhn & Medves, 2004). These infant responses set up a difficult interaction pattern for both the infants and their parents.

1.4 The Impact of the NICU on Parent-Infant Interaction

In the early 1960s, parents were only allowed to observe their preterm infants through glass windows (O'Donnell, 1990). However, things have changed since then,

particularly in resource rich countries where parental involvement is currently advocated in the NICU. Klaus and Kennell (1982) pioneered the contention that greater contact between mother and infant leads to a stronger and closer bond formation that is crucial for infant survival and cognitive development. In fact, their research has affected hospital policies and encouraged rooming-in for the mother with her baby post-delivery.

Separation between the mother and the infant directly after birth interrupts the natural attachment process and has a range of negative effects on parent-infant interactions, maternal mood, and family function (Flacking et al., 2012). Moreover, higher maternal depression scores were associated with lower quantities of expressed breast milk, longer latencies to the first breast-milk feeding, reduced maternal affectionate touch, and slower infant cognitive skill development (Feldman & Eidelman, 2003; Meier, Furman, & Degenhardt, 2007).

Having a preterm infant puts the family under severe stress, as they experience uncertainty and anxiety during this period of waiting (Hamilton & Redshaw, 2009). The sources of stress for parents are mainly separation from and the fragile appearance of their baby in the high tech NICU environment, and fear of their infant's death (Holditch-Davis & Miles, 1997; Pohlman, 2009; Whittington, 2010). Parents often face a lack of support as well as limited participation in their infant's care and decision making which creates parental role conflict (Hamilton & Redshaw, 2009; Parents of Premature babies Project (POPPY) Steering Group, 2009; Nyqvist & Engvall, 2009), insecure feelings about their parenting, and altered bonding between infant and parents (Francis et al, 2002; Klaus & Kennell, 2001; Uvnas-Moberg, 1996; Winberg, 2005; Aagaard & Hall, 2008; Brazelton, 1976; Bystrova et al., 2009). These indicators demonstrate that more work is needed to find better ways to support the infant's growth and development as well as parent-infant bonding.

1.5 Interventions to Reduce the Infant's Stress

In the last few decades, several interventions to reduce the infant's stress and improve the infants' health outcomes have varied from creating a friendlier NICU environment by reducing noise and light, to clustering nursing care and limiting painful stimuli, to FCC and introducing therapeutic touch through KMC and MPM. Each of these will be described in sections 1.5.3 and 1.5.4. The NICU consists of two environmental factors: the physical and the human. The physical environment includes equipment, noise and light. The human environment includes the medical and nursing staff as well as the parents.

1.5.1 Family-centred care (FCC)

FCC aims to promote care planned around the whole family and to provide information, comfort, empowerment and professional support to families during the NICU hospitalization of their infants (Cooper, Gooding, Gallagher, Sternesky, Ledsky, & Berns, 2007; Burger, King, & Tallett, 2015). It is defined as: “An approach to the planning, delivery and evaluation of health care that is governed by a mutually beneficial partnership between HCPs, patients and families” (Kuo et al., 2012). The FCC concept has been developing since 1993 with other interventions being added to it increasing its effectiveness with more services designed around the child and family needs (Cockcroft, 2012; Nichols, 2013). Ramezani et al. (2014) defined FCC as a comprehensive, inter-disciplinary and common participation of the professional team in the holistic care of neonates to promote quality care while maintaining the respect and dignity of the family (Ramezani et al., 2014). They argued that FCC should be a gold standard for health care and treatment in the NICU. Therefore, FCC is based on interpersonal skills for building relationships between the parents and caregivers since parents are considered partners in this care (Jones, Woodhouse, & Rowe, 2007). It is

focused on involving and educating parents in the daily care centred on nursing management and family-based interventions to minimize the stress of NICU care in the hope of improving the neurodevelopmental outcome of the infant (Bustani, 2008; Hamilton et al., 2008; Hendricks-Muñoz et al., 2010). It is suggested that nurses play a crucial role to facilitate the involvement of parents by teaching them the necessary skills to cope with the NICU stressors and become advocates in the care of their infants (Blackburn, 1998; Chia, Sellick, & Gan, 2006; Whittington, 2010). Involving parents in care interventions in the NICU is suggested for both the parent's and infants' emotional, social and physical wellbeing (Aucott et al., 2002; Sizun & Westrup, 2004; Örtenstrand et al., 2010).

The UK health care system, as one example, stresses the importance of involving parents in the NICU which underpins the philosophy of infant care nursing to deliver and implement the highest quality care (Burger, King, & Tallett, 2015). This means that care and service development must be built around the needs of the family rather than the convenience of the health care providers. The Parents of Premature babies Project (POPPY) model of care emphasizes the importance of family-centred care and of a parent–HCP partnership including information sharing, communication, available support services, involvement and sharing in the decision making (POPPY Steering Group, 2009). A reflection on a large scale survey of parents' experiences of neonatal care carried out in England in 2014 by Burger et al. (2015) shows that adopting FCC in the NICU setting by involving parents in the care improves attachment and builds the parents' confidence to care for their infant. This highlights the importance of the role of neonatal staff not only in caring for vulnerable babies, but also in assisting parents who may be particularly concerned and emotional during a time of uncertainty (Burger et al., 2015). Employing FCC creates a nurturing environment for the

development of healthy attachments between parents and infants. To date, FCC has not yet been appreciated or implemented in Lebanon.

1.5.2 Touch

Touch is defined as "direct contact between two physical bodies. In neuroscience, touch describes the special sense by which contact with the body is perceived in the conscious mind" (Gardner, 2010, p.1). Touch is one of the first senses developed by the foetus at about 7.5 weeks gestational age and one of the most advanced senses at birth (Als, 1986; Montague, 1986; Graven & Browne, 2008). Touch is particularly important for the psychological, mental, and physiological development of preterm/LBW infants (Als, 1986; Blackwell, 2000; Montague, 1986; Field, 2010a) Touch and tactile stimulation are important in early human motor, communication and social development and are central to the development of bonding between the mother and the child (Bowlby, 1988; Brazelton & Barnard, 1990; Bystrova et al., 2009; Kearvell & Grant, 2010). Winkler (2000) and Bowlby (1982) explained that the bonding process is initiated at birth through the five senses of touch, smell, taste, sound and vision. Touch leads to attachment, the parent's "awareness of the child's verbal and non-verbal cues" (Wallace, Roberts, & Lodder, 1998, p. 900), and the parent's ability to adjust their interactions to the needs, cues and communications of the infant (Vereijken, Rikson-Walraven, & Kondo-Ikemura, 1997). Als (1986) recognized the interconnection between intrinsic and extrinsic factors in relation to the infant's adaptation to the extra-uterine environment and the important role of the mother's touch. This interconnection is considered a positive intervention and as such provides positive emotional energy to reduce stress in the NICU. The parents' touch of their infant promotes bonding, attachment and security (Obeidat, Bond, & Callister, 2009). Depending on the degree of prematurity and the extent of genetic and biological complications (Allen, 2008), the

NICU stay deprives the preterm/LBW infants of the sensory stimulation that existed while in utero (Vaivre-Douret et al., 2009).

1.5.3 Kangaroo mother care (KMC)

The original method of Kangaroo Care (KC) developed in 1978 by Rey and Martinez in Bogotá, Columbia, included mother-infant skin-to-skin care in the kangaroo position 24 hours per day. KMC as a form of touch is defined as the baby being clothed in only a diaper and a cap and put in an upright, prone position on the mother's bare chest, between her breasts and under her clothes to form the maternal pouch. Research suggests that preterm infants receiving KMC have better vagal tone maturation, periods of quiet sleep, and alert wakefulness as well as less fussiness, more mature neuro-development, stable mean temperatures and enhanced attachment and bonding (Feldman, Weller, Sirota, & Eidelman, 2003; Feldman, Weller, Sirota, & Eidelman, 2002; Feldman & Eidelman, 2003; Ferber & Makhoul, 2004; Kenner & McGrath, 2004; Conde-Agudelo et al., 2012; Cong, Ludington-Hoe, & Walsh, 2011; Cong et al., 2015). However, this method has been amended in some NICUs to be implemented intermittently over a limited period of time for up to several hours per day (Nyqvist et al., 2010).

According to a Cochrane review (Conde-Agudelo & Diaz-Rossello, 2016), prematurity is challenging as the incubator is a physical barrier for mothers to touch their infants and respond to their early feeding cues, which in turn will impair adequate mother-infant bonding and breastfeeding initiation. Skin-to-skin contact between the mother and her infant directly after birth has been researched as a facilitator to the release of hormones that helps contract the uterus, stimulate a milk let-down reflex and milk production, relax the mother and enhance mother-infant bonding (Kennell & McGrath, 2005; Conde-Agudelo & Diaz-Rossello, 2016; Cong et al., 2015).

1.5.4 Infant massage (MPM)

Massage therapy is defined by the American Massage Therapy Association (AMTA, 2008) as the manipulation of the soft tissues of the body for the purpose of normalizing those tissues. Massage will in turn affect the circulation of the blood and the flow of blood and lymph, reduce muscular tension or flaccidity, affect the nervous system through stimulation or sedation, and enhance tissue healing and/or strength (AMTA, 2008). It consists of manual techniques that include applying fixed or movable pressure, holding, and/or causing movement of or to the body. The oldest written record of massage is approximately 4,000 years ago and was noted in Chinese medical literature known as: "kneading or rubbing down the entire body with the hands and using a gentle pressure and tractions on all the joints" (Fritz, 2016, p. 16).

Massage is an old practice that dates back to the 2nd century B.C. The word “massage” is derived from the Arabic root “mass’h” which means to touch or press softly, or the Greek word “massein or masso” meaning to touch, squeeze, or knead (Fritz, 2016, p. 5). The ancient Egyptians developed their own form of massage therapy in 2500 B.C. that focused on specific points of the body to heal and rejuvenate. In ancient Greece, massage therapy was used in the medical world when Hippocrates (460 to 380 B.C.) advocated that the physician must be experienced in the art of rubbing or massage (Yapijakis, 2009). Massage spread from one civilization to another and from one continent to another and has evolved over the centuries into the science that we know today (Mitzel-Wilkinson, 2000; Mainous, 2002; Mullany et al., 2005).

Massage for full term infants is one of the oldest touch therapies and it is one of the most popular interventions that has existed across countries for generations (Field et al., 1996; McClure, 1989). This very old practice estimated from 3000 B.C., has been practised on a daily basis for healthy new-borns in India (Kulkarni, Kaushik, Gupta,

Sharma, & Agrawal, 2010). For instance, in Western India, mothers massage their infants believing that this practice enhances the infant's motor development, provides relaxation, stimulates respiration, circulation, digestion and elimination and promotes strong bones (Leonard, 2008). Massage as a tradition has been passed down for generations in Far Eastern cultures as a vital element of mothering for the full term infants' first months of life (Field, 1994; Porter, 1996). In the East, massage was deeply rooted in Islamic tradition as a continuation of Greco-Roman folklore. It was kept alive by the people of the community and became part of their folk culture (Fritz, 2016). In the modern ages, massage has been known for its therapeutic effects. The Swedish movement system was added to the concept of massage, and was introduced by the Taylor brothers to the United States in 1856 (Fritz, 2016). Later in 1916, with the work of Mennell (Fritz, 2016), the effects of massage were divided into mechanical and reflexive actions. Mennell emphasized the four ways that the mechanical effect is exerted on the body; by 1) aiding venous return to the heart; 2) promoting lymph movement; 3) stretching the connective tissue; and 4) stimulating the stomach, small intestine, and colon. The American Massage Therapy Association (AMTA) as a professional massage organization was among the first to be established in 1943 with the aim to disseminate the benefits of massage. Today, it is believed that massaged full term infants enjoy sound sleep, have less gas and colic, and demonstrate a better healing process during illness by easing congestion and pain (Field, 1994).

A survey conducted in Bangladesh found that 96% of mothers massage their full term infants' whole bodies between one and three times daily (Darmstadt et al., 2002). Other studies conducted in India and Bangladesh proposed that massage with oil was effective to avoid any possible irritation from the friction while also associated with the provision of nutrition through transcutaneous absorption of lipids, the promotion of better muscle formation and gain, and an increased weight when done in conjunction

with kinaesthetic stimulation (Kumar et al., 2012; Kulkarni et al., 2010). Different oils have been touted to be effective when routinely used in infant massage including mustard oil (Darmstadt & Saha, 2002), coconut oil (Sankaranarayanan et al., 2005), and olive oil (Cooke, Cork, Danby, & Lavender, 2011; Cooke et al., 2016).

In high income countries such as the U.S., infant massage was introduced in the late 20th century (Field, 1994). The techniques used were introduced by massage therapists who had been trained in India and who brought this ancient practice to the U.S. McClure is the founder of the first and largest International Association of Infant Massage (IAIM) in the U.S. for the dissemination and preservation of this ancient art. She combined the ancient Indian practice of massage with modern Swedish methods referred to as the "Swedish massage" for the physical and psychological benefits of the infant. Swedish massage includes the five basic strokes: effleurage (sliding), petrissage (kneading), tapotement (rhythmic tapping), friction and vibration. The belief is that these strokes are helpful in reducing pain and improving general function for the massaged infant (Hodgson & Lafferty, 2012).

Massage provides an opportunity for parents to access their infant's sense of touch (Winkler, 2000), minimize the effects of stress and separation and promote bonding. Massage as a form of therapeutic touch was suggested to overcome touch aversion caused by the negative and painful noxious stimuli (Vickers et al., 2004), and to promote physiological changes by stimulating the nervous system (Field et al., 2006).

1.5.4.1 Preterm/LBW infant massage

To be more specific, massage in preterm/LBW infants has been defined by many researchers as the art of stimulating both the tactile senses and all peripheral pressure receptors in the soft tissue of the preterm infant (Field et al., 2004; Guzzetta et al., 2009; Procianoy et al., 2010). Preterm infant massage or tactile therapy involves an

abbreviated/gentler manipulative therapy of soft tissue by touching, softly squeezing, rubbing, handling or kneading with the hands in order to affect a positive change, though specifically omitting the abdomen to prevent regurgitation (Field et al., 1996; McClure, 1989).

1.5.4.2 Types of massage for stable preterm infants

This section highlights two types of massage techniques; light and moderate pressure massage. Within the topic of moderate massage the most common techniques used on preterm infants as published in the literature will be highlighted.

1.5.4.2.1 Light touch massage

Light touch massage, defined as light stroking, is considered a tickle stimulus that has a different physiological effect compared to MPM (Scafidi et al., 1990; Adamson-Macedo, & Hayes, 1998). Adamson-Macedo and Attree (1994) suggested specific definitions for stroking and massage. For instance, stroking entails caressing the skin softly in one direction whereas massage implies kneading and rubbing that involves friction.

Bond (2002) explains that light touch has been found to be over-stimulating and actually irritating to preterm infants. This type of stimulation has been reported to cause "apnoea, bradycardia, decreased oxygen saturation levels, and excessive energy expenditure through increased activity, avoidance behaviours, tachycardia, tachypnea, and hypoxemia" (White-Traut et al., 2010, p. 390), and was not associated with any weight gain (Field, 2002; Field et al., 2010b).

1.5.4.2.2 Moderate pressure massage

The MPM is a gentle, slow stroking of parts of the body, with or without oil. MPM might be done alone as a tactile stimulation (TS) or with kinaesthetic (passive) stimulation (KS). Tactile/kinaesthetic (T/K) stimulation consists of body stroking with moderate pressure and passive movements of the limbs. The most common four types of MPM are described in Table 1.1.

Table 1.1: The Four Most Common Types of MPM

MPM type	**Tactile / kinaesthetic T/K**	**Duration**	**Method**
Field et al. (1986) USA	✓	15 min stimulation session consisting of 3 standardized five-minute phases. Prone MPM for 5 min, Supine KS for 5 min, Prone MPM for 5 min. Calls for a momentary suspension of touch and massage at any sign of discomfort for the new-born for 15 seconds.	(1) MPM from the top of the head to the neck, (2) MPM from the neck across the shoulders, (3) MPM from the upper back to the waist, (4) MPM from the thigh to the foot to the thigh on both legs, and (5) MPM from the shoulder to the hand to the shoulder on both arms. The infant was then placed in a supine position for the subsequent kinaesthetic stimulation phase.
McClure massage (2009) United States early 1970s	✓	This technique has systematic head-to-toe, supine-to-prone, and midline-to-periphery progression. McClure's massage for 15 min only includes slow massage actions without breaking skin contact at signs of discomfort, allowing the new-born to adapt.	Ancient Indian practice mixed with modern Swedish methods and focused on total masseur-infant interaction. Provides moderate pressure strokes towards and away from the heart, following infant cues has been used primarily in term infants and includes the full body divided into six anatomic regions: face, upper limbs, thorax, abdomen, lower limbs, and back. It ends with stretching of all limbs.

Vaivre-Douret method (1997) France	✓	Massage for 15 min, 2 times daily during the periods of wakefulness	Massage protocol stimulates all areas of the body with moderate pressure, moving from the abdomen to the thorax and shoulders, followed by massaging one half of the body covering the arm, hand, leg and foot, and then the other half of the body, and then a prone position to massage the back, shoulders and nape of the neck, ending with a supine position to touch the head and face and to do kinaesthetic stimulation.
Mathai et al. method (2001)	✓	Sessions begins 30-45 minutes after a feed in the morning, afternoon and evening. The total duration of each session is 15 minutes. If the baby starts crying or passes urine or stools during the session, it is temporarily stopped till the baby is comfortable again.	*Phase I: P*rone position. Twelve firm strokes with palms of the hands of 5 seconds: (a) Head (b) Neck (c) Shoulders and (d) Back with firm, long strokes with alternate hands. *Phase-II: S*upine position. Twelve firm strokes with palms of the hands, of 5 seconds each: (a) Forehead (b) Cheeks (c) Chest - 'butterfly' stroking from midline upwards, outwards, downwards and inwards back to initiating point; (d) Abdomen in a clock wise direction around abdomen (e) Upper limbs (each separately) (f) Lower limbs (each separately) (g) Palms (h) Soles using alternate hands for stroking. *Phase-III:* Supine position and consisted of passive flexion and extension movements of the limbs of 2 seconds each.

The greatest body of evidence in research and what will be examined in chapter two is related to the MPM as the typical massage used on preterm/LBW and demonstrated by the researchers in this field as seen in Table 1.1. Light touch, however, due to its negative effects will not be considered further. MPM will be further investigated as an option for this study and as a potential future intervention by parents in the NICU.

1.6 Lebanese Context

This section examines the Lebanese context. The first part includes a geographic and historical overview of the country drawing on its societal, economic and health care system structures. The second section contains a description of the Lebanese NICU health care system and the NICU environment. The third section covers the nurses' role in the NICU and previous massage experiences in Lebanon.

1.6.1 Overview of the Lebanese context

Lebanon is a small, middle income, democratic country with an area of 10,452 km², and a length of 210 km situated on the Mediterranean coast between three continents; Asia, Europe and Africa, East of the Mediterranean Sea (Figure 1.1). The total estimated population is presently 4.5 million mostly concentrated in the largest coastal cities of Beirut, Tripoli, Saida, Tyr, and Jbeil due to the centralization of most services and trading institutions (Miller, Kim, & Holmes, 2015)

Figure 1.1: Map of Lebanon. (http://www.mapsofworld.com/lebanon/lebanon-political-map.html).

Description: **Lebanon Political Map helps the user in getting a clear idea about the various parts of Lebanon with international boundaries, state boundaries with their capitals, the national capital and other important cities.**

The key strategic geographical position of Lebanon in the Mediterranean region gave birth to its many celestial religions and brought different missionaries to the

country (Mehdi, 1978). This created a country strongly influenced by religious groups (17 religious communities), whose freedom of belief has been guaranteed by the Lebanese Constitution - Article 9, Lebanese Constitution, 1926 (Maktabi, 1999). The historical circumstances and contemporary events have led to the current cultural diversity, cosmopolitan Lebanese structure, openness to the world, and the flourishing of the educational, agricultural, banking, and tourism sectors (Haddad, 2015).

Lebanon witnessed a 15-year civil war (1975-1990) followed by intermittent periods of unrest, political instability, security breaches, and geopolitical struggles, which have had catastrophic consequences on all levels including the public and private health sectors (Ammar, 2009). Moreover, the crucial Middle East crises of Palestine and Syria have led to political insecurity and the influx of more than 500,000 Palestinians between 1948 and 1970, as well as more than 1,500,000 Syrians since 2011. These refugees have congregated mostly in camps creating pockets of poverty, as well as being dispersed in cities and villages across Lebanon (Haddad, 2015). Lebanon has more refugees per capita than any other country in the world, which has resulted in demographic changes and huge economic repercussions, mainly on the trade industry, tourism and the newly emerging niche of medical tourism (Haddad, 2015).

The private hospital sector is considered the backbone of the Lebanese health care system of which 12 are university hospitals (Ammar, Wakim, & Hajj, 2007). During the war, the private health sector took advantage of the collapse of the public hospital system and flourished providing high-tech medical care. Even though it experienced chaotic and unregulated growth, the level of sophisticated medical technology available in Lebanon compares with that of high-income countries (Sfeir, 2007). Lebanon has developed in medical tourism servicing people from across the Middle East and North Africa (MENA) region.

In the year 2000, the Ministry of Public health (MOPH) finally established an accreditation system for the hospitals in Lebanon to evaluate their quality of care. This accreditation is based on the services they provide relative to minimal requisites that a hospital should respect. Out of 165 hospitals (137 private and 28 public), 128 were assessed, of which only 36.7% achieved total accreditation that includes basic and superior standards (an index superior to 80% for basic standards and superior to 60% for accreditation standards), and 25% lacked the basic standards for accreditation (Moujabber, 2013; Sfeir, 2007). Only one public hospital with university affiliation provides free general care. Predominantly, public hospitals are under-equipped, offer low quality services, lack qualified HCPs, and represent 15% of the total capacity of both private and public functional beds (El-Jardali, Saleh, Ataya, & Jamal, 2011). Furthermore, the MOPH subsidises the private sector so that any Lebanese citizen without medical insurance can receive treatment, often in private hospitals at the expense of the MOPH, since there are not sufficient beds in the public sector.

The current health system is described as being fragmented, atypical and pluralistic between the public and private sectors (Kronfol, 2006; Sfeir, 2007) focusing mostly on curative care services. Lebanon suffers from underreporting and a lack of national, comprehensive, and accurate health data (Kronfol, 2006). Around 8% of Lebanese households live below the poverty line, creating a significant disparity in health, social and economic conditions (Salti & Chaaban, 2010). The cost of healthcare in Lebanon is not affordable on the average person's income. Tertiary health care services are very costly, often focused on high tech, are offered mainly by the private sector and concentrated in the major cities. Care can be provided in private hospitals covered by MOPH but with limited beds. Therefore, parents usually have to pay for the care of their infants in coordination with the parameters of their insurance coverage in private hospitals otherwise they must admit their infants to a public hospital where most

costs are covered. The majority of the population are under various plans such as the National Social Security Fund, National Health Fund, National Health Insurance Fund, Civil Servants Cooperative, National Health Insurance, the Lebanese army social security or private insurance with varying amounts of coverage (El-Khoury, Kosremelli-Asmar, & Stephan-Yeretzian, 2012). Most of the MOPH's budget is spent on financing high-technology curative medical care in private hospitals to the exclusion of preventive care or the care of patients in public hospitals (Kassak, Ghomrawi, Osseiran, & Kobeissi, 2006).

In reference to the value for cost, Lebanon offers the highest quality of services as the level of medical and paramedical education compares to the level of education in high-income countries (Sfeir, 2007). There are 3.2 physicians per 1000 individuals compared to 1.6 per 1000 in the U.S. and there are 1.18 nurses per 1000 individuals compared with a global average of 4.06 per 1000 (Ammar, 2003; Kronfol, 2006; El-Jardali et al., 2009; Ammar, 2009). Therefore, the data highlight an imbalance with a very high ratio of physicians to nurses i.e. three doctors to one nurse reflecting the serious shortage of nurses for patient care (Order of Nurses in Lebanon, 2009).

In Lebanon, female participation in the labour force increased from 12.5% in the 1960s to 32.3% in 2000, and further increasing in 2007 to 42.6% of the total labour force (Central Administration of Statistics (CAS) Republic of Lebanon, Living Conditions Survey 2009). The majority of working women in Lebanon are employed by the private sector at 85.3% in comparison with 14.7% of women working in the public sector (Torres Tailfer, 2010). It is worth noting that there is a high rate of women who quit their work after marriage and/or childbirth. Lebanon has not yet ratified the International Convention for the Protection of Maternity #183, or recommendation #191. The maternity leave in Lebanon remains one of the shortest in the world, which allows the mother a maximum of 10 weeks of paid maternity leave -Law # 266 (Akar &

Mouchantaf, 2014), including the period directly before and after delivery. This law does not comply with the recommendation of the International Labour Organization to raise maternity leave to at least 14 weeks with benefits (International Labour Organization, 2016). Due to the ongoing turbulent political situation and security instability in the country, the government has been unable to enforce legislation on the private sector, and maternity leave has been left to the discretion of the employer. This condition has obliged women to leave their infants for work very early. All these factors contribute to a higher risk of problems with breastfeeding and mother-infant bonding (World Breastfeeding Trends Initiative, 2010). One study looking at the determinants of breastfeeding in Lebanon indicated that the maternity leave length was insufficient for breastfeeding support (Hamade, Chaaya, Saliba, Chaaban, & Osman, 2013). In addition, a study by Saadé, Barbour and Salameh (2010) reported that each additional week of leave was associated with a 2% reduction in the odds of reporting poor mental well-being of the mother, which was also indirectly associated with the continuation of breastfeeding.

Therefore, there is a clear need in Lebanon for strategies to change the environment in order to reflect more positively on the infant's behaviour, the caregiver and the family. The next section describes the Lebanese NICU health care system and its impact on the infant and parent-infant interaction.

1.6.2 Lebanese NICU health care system

Overall, health indicators in Lebanon have recorded levels similar to those in the U.S. (without the refugee population), with low rates of infant and child under-five mortality (Ammar, 2009). As mentioned earlier, a higher percentage of neonatology units offering high-tech services exist in the private sector in comparison to the public sector. This explains the positive neonatal health indicators. However, they are

generally focused on medical care missing any focus on the family centred approach. Additionally, the discrepancy in the number of nurses vs. physicians partially explains the lack of attaining FCC and the efforts currently being deployed to enhance an interdisciplinary healthcare environment. Almost half of the registered nurses (14,000) hold a technical degree (Order of Nurses in Lebanon, 2009) which fits with their greater interest in technical medical acts such as the insertion of peripheral IV lines. The rest have a Bachelor of Science in Nursing (BSN) providing fertile ground for the promotion of FCC. The FCC could have an important influence on the environment of the care given to families and infants in the NICU recognizing the family and the infant as the focus of care and involving parents in the care to a greater extent, though it needs further development in Lebanon.

Very few NICUs in Lebanon qualify as level III units i.e. where continuous care is provided by neonatal specialists with the availability of life support equipment (Badr, Abdallah, & Purdy, 2011). Doctors dominate maternal and neonatal health care. 90% of births are attended by physicians, most of who practise in private hospitals (Kronfol, 2006; Ammar, 2009). Services are provided in the NICU using a medical practice model that emphasizes procedures and medical acts rather than holism and caring. This negatively impacts the quality of care, missing the advantages of a greater focus on family support and education by health care providers.

Despite the fact that several studies have suggested an association between painful stimuli and long term developmental and behavioural problems (Mountcastle, 2010; Durrmeyer et al., 2010), none of the NICUs have adopted a standardized tool for pain assessment as mentioned earlier. NICUs in Lebanon also do not have written discharge plan protocols or written discharge booklets with clear protocols for neurodevelopmental follow-up for premature infants. Infants are discharged from the hospital based on their weight (i.e. two kilograms to be eligible for discharge, but not on

the mother's and/or baby's readiness). Most of the infants after discharge are referred to their private paediatricians only when they are sick or for vaccinations, increasing the risk of failure to diagnose infants with neurodevelopmental problems and learning disabilities until it is too late for proper early intervention.

Most NICUs in Lebanon are housed in a closed area with controlled access and scheduled visiting hours. These NICUs consist of an open area with limited space between incubators. They do not have family-infant accommodations. In addition, there is no policy related to light and/or noise reduction (Badr et al., 2011; DeJong et al., 2010). There are no regulations to facilitate the parents' presence in the NICU (Badr et al., 2011) preventing their full participation in the care of their infant. Parental involvement usually includes visiting the NICU with observation if the infant is unstable, and touching and holding the infant if stable during visiting hours in the NICU; all delaying parent-infant interaction and early bonding.

Nurses are the first line of contact in parent-infant interaction, and in general they assist parents in establishing the bonding with their infants (Chia et al., 2006; Brett et al., 2011). They have the potential to provide support and empower parents to build on their intuitive strength in the care for their infants (Griffin, 2000; Griffin 2006; Lundqvist, Westas, & Hallström, 2007; Kearvell & Grant, 2010; Jambulingam, 2016). In Lebanon, early separation of mother and preterm/LBW infant is the norm, and this creates parental stress and a delay in bonding. The nurses' time constraints further increase the parents' stress and result in their reduced confidence in handling their fragile infants (Badr et al., 2011; Turan et al., 2008). In Lebanon, research on the psychosocial dimension of having a preterm/LBW infant in NICU is under-investigated.

1.6.3 Massage experiences in Lebanon

In the Lebanese society, parents usually touch and cuddle their infants as part of childrearing practices. The culture of touch is well accepted especially with full-term newborns. Infant massage is practised in some villages and ethnic groups, particularly utilizing an olive oil massage; the practice is usually conducted on an individual basis. It is influenced by the mother's experience on a trial and error basis and not perceived as a priority, but merely as a pleasure in connecting and communicating with the newborn. It is also considered to have moisturising qualities and soothing effects on new-borns. However, MPM has not been applied in the NICUs in Lebanon as part of routine care until now; partly because of a limited understanding of its role as an intervention, but mostly because HCPs rely mainly on medical interventions for the care of infants in this environment. In addition, contextual barriers such as hospital characteristics, human resources and nursing leadership are potential causes to the hindering of its implementation.

However, a historical shift has been observed worldwide in recent years toward increased handling of preterm infants including actions such as rocking, massaging, and skin to skin holding. These actions have been suggested to facilitate weight gain, advances in feeding abilities, and improved interactive behavior (Chertok, McCrone, Parker, & Leslie, 2014; Field, Diego, & Hernandez-Reif, 2010a; Field, 2010a; Anderson et al., 2003a; Zealey, 2005; Dodd, 2005; Conde-Agudelo et al., 2012; Cong, Ludington-Hoe, & Walsh, 2011). The majority of research in the NICU on parental perceptions has focused on the mothers' experiences. However, one pilot study using mixed methodology of 12 full term infant-father dyads by Cheng, Volk, & Marini (2011) in Canada found that infant massage instruction was also effective in significantly decreasing paternal stress.

From a contrasting perspective, a qualitative study by Gravem et al. (2009) in the U.S. using semi-structured interviews with mothers believed that over-stimulation relative to exercise (KS moving the joints) may have a negative effect on the growth and development of the preterm infant. This highlights the importance of the subtle differences in applications. What is not known is the appropriate amount and type of stimulation and in what context is most beneficial. Interestingly, this variety of interventions, whether appropriate or inappropriate have been almost ignored in the Lebanese NICU practice. Instead, a minimal touch strategy has been followed to reduce overstimulation and the risk of infection; HCPs are only focusing on purely medical interventions with infants, reportedly due to the shortage of staff, creating a lack of time and work overload. However the views of nurses in Lebanese NICUs about massage therapy are unknown.

In the absence of any current studies on infant massage in the NICU in Lebanon, Abdallah, Badr, & Hawwari, (2013) conducted a quasi-experimental study to assess the short and long term benefits of MPM on 66 stable preterm infants in two university hospitals with tertiary level NICUs (Abdallah et al., 2013) other than those referred to in this thesis (Appendix 34). In this study, MPM was implemented by the mothers in a well-controlled environment and was standardised by an external person rather than the existing staff. Mothers were introduced gradually to the idea of massaging their babies and trained on a doll before applying the intervention in a real life situation. Mothers were supported by nurses who were trained specifically for the study, and infants were closely monitored for any signs of distress. Infants who were massaged had positive results with significantly lower scores on the Preterm Infant Pain Profile (PIPP) scale after a heel stick compared to before the massage and had lower PIPP scores at discharge compared to the control group. Massaged infants had higher cognitive scores (Bayley scores) at 12 months corrected age. Weight gain, length of stay, breastfeeding

duration and motor scores did not differ between groups (Abdallah et al., 2013). These stable preterm infants benefited notably from the massage therapy given by their mothers. The study concluded that MPM may be a culturally acceptable form of intervention to improve the outcome of preterm infants. The implementation of the mother's massage on stable preterm infants was feasible within the quasi-experimental environment. However, the challenges for a more widespread implementation and the evaluation of what barriers or facilitators might be present were not investigated. In general, the fact that the premature infant is less likely to be touched and held by his parent than full term infant may decrease parental willingness to massage their baby (Browne, 2000). One of the crucial elements is to look at the factors that may contribute to further barriers to implementing the MPM such as maternal fear, lack of education, safety issues and time concerns (Hanson, 2013). This topic obviously needs to be further explored in order to even start to enable a wider adoption of the MPM in the Lebanese context.

As a conclusion, in the Lebanese NICU culture, massage could be suggested as an appropriate, acceptable, easy to learn and doable intervention for parents and HCPs to implement. However, there appear to be organizational barriers to its implementation within the context of Lebanon. For example, the NICU environment is not family centred as there is no available space dedicated to parents or available rooms for parents to stay overnight. The majority of Lebanese NICU settings are not suitable to accommodate the parents' presence for long durations due to strict NICU visiting policy (Badr et al., 2011). Furthermore, it is still unclear at this point what might be the perceptions of Lebanese HCPs and parents relative to MPM considering the physical setup and the limited space in the NICU and traffic in the room. The MPM might be potentially difficult to implement in the current context and circumstances.

Introducing massage must take into account the evidence on its effects and the cultural, contextual and organizational relevance to facilitate later adoption in the NICUs. In many countries, the mother and preterm baby are separated after birth (Örtenstrand et al., 2010). However, MPM intervention provides the opportunity for the parents' participation in the health care of their infant during this period. It is expected that the introduction of this intervention would positively impact the parent-infant interaction to better respond to their infants' cues and needs.

1.7 Rationale for the Study

There are still many NICUs worldwide that do not involve parents in any aspect of the care provided. Parents having an infant in the NICU can be a crisis for the family causing feelings of fear, sorrow, shock, frustration, guilt, and worthlessness (Cameron, 1996; Ayala, 1999; Affleck, Tennen, & Rowe, 2012; Affonso et al., 1992; Lefkowitz, Baxt, & Evans, 2010). In addition, the structure of the NICU is often frightening and intimidating for parents with limited space for family to stay for any length of time especially for parents who may live a far distance from the NICU. Parents sadly often have limited participation in their infants' care. Therefore, bonding between the infant and parents may be delayed, potentially creating detrimental long-term physiological and emotional effects. Massage is a model of care that has the potential to support the preterm infants' transition from intra to extra uterine life and empower parents to have a role in the NICU. To enhance the parents' provision of massage in the NICU, it is important to explore the parents' and HCPs' perceptions and attitudes regarding the barriers and facilitators that would affect future implementation of infant massage in the Lebanese NICU environment.

In the last three decades, studies have been published on the effects of massage on growth and development of the preterm and LBW infant (Field, 2010a; Zealey,

2005; Vickers et al., 2004). However, the available literature on infant massage is not conclusive, resulting in contradictory information and insufficient guidelines for the NICUs. This evidence needs to be evaluated whether this intervention should be adopted for preterm and/LBW infants in the NICUs. Clearly the evidence on MPM needs to be examined further.

1.8 Two-step Study Aims and Research Questions

This thesis utilizes a two-step approach. First, a literature review divided into two parts -scoping and integrative - examines the current evidence on the effectiveness of the MPM and the facilitators and barriers in relation to context when implementing this massage technique in the NICU. The following research questions for the literature review were asked:

1. What is the evidence of the effects of infant massage on preterm and/or LBW infants?
2. What are the mechanisms of action and underlying theories regarding infant massage?
3. What are the facilitators and barriers in relation to the context when implementing massage techniques on preterm and/or LBW infants in NICU?

In reference to the second stage, a qualitative investigation was conducted based on the gap identified in the literature review. To address the aims of the second step of the study, the following research questions were asked:

1. What are parents' perceptions and attitudes towards massage as a potential culturally acceptable form of intervention provided by them in the NICU to improve the outcome of their stable preterm infants?

2. What are the perceptions and attitudes of HCPs concerning massage as a potential culturally acceptable intervention provided by parents in the NICU for stable preterm infants?
3. What are the cultural, contextual and organisational processes that might hinder or facilitate the application of infant massage in the NICU from the HCPs' and parents' points of view?
4. What are the similarities and differences between HCPs' and parents' perceptions and attitudes regarding massage application in the NICU with respect to RQ 1, 2 and 3?
5. What is the interplay between the cultural and contextual factors that might influence future implementation processes of infant massage in a Lebanese context?

This chapter has provided definitions and a brief overview of infant massage considering several other supportive interventions to reduce the infant's stress in the NICU. The Lebanese context has also been discussed reflecting on the NICU setting. Lastly the two step research questions have been detailed. The next chapter will explore the evidence available on MPM and its impact on short and long-term outcomes for infants as well as parents.

CHAPTER 2 : REVIEW OF THE CURRENT EVIDENCE ON INFANT MASSAGE

2.1 Introduction

The notion of MPM as a complex multifaceted process involving a range of multiple interventions, outcomes, and participants with different age groups, settings, and stakeholders (Dryden, Baskwill, & Preyde, 2004; Vickers et al., 2004) has been a topic of interest to many researchers over the past 40 years. While MPM has not been reported to have any adverse effects especially on stable preterm/LBW infants, its benefits remain controversial and not routinely advocated in NICUs (Browne, 2000; Modcrin-McCarthy et al., 1997; Vickers et al., 2004). A number of reviews have been published that support infant MPM. However most are non-systematic reviews such as those by Field (2002) and Ireland and Olson (2000). These reviews lack inclusion criteria relating to outcomes, do not provide information on study design, and their search was limited to selected peer-review journals.

To examine the evidence, gaps and future needs in the available literature, this chapter reports on two reviews that combined, set the stage for the empirical study. The first was a scoping of systematic reviews regarding the effectiveness of MPM in hospitalized infants in the NICU to identify previous research and determine the need to conduct a systematic review. The second review is an integrative review building upon the evidence found in the first review to identify short and long term outcomes of MPM on hospitalized preterm/LBW infants and its potential for implementation. The integrative review seeks to examine the current evidence on the facilitators and barriers in relation to the context when implementing massage techniques in the NICU. It was guided by specific questions to identify the gaps in the literature and frame the aims and research questions of the original study.

2.2 First Review: Scoping Review of Systematic Reviews

Scoping reviews are the first step in mapping relevant research in relation to the searched topic in order to examine previous research and identify research gaps/future needs (Arksey & O'Malley, 2005; Grant & Booth 2009). This preliminary assessment aimed to identify the nature and extent of research evidence (Grant & Booth 2009). Scoping review methodologies provide greater conceptual clarity about existing evidence to guide more focused research (Davis, Drey, & Gould, 2009). The term 'scoping' has been widely used by reviewers, but is not well defined. According to Armstrong et al. (2011), p. 149, "a scoping review is a specific type of review, which can provide a structured approach to the gathering of background information to inform the conduct of a systematic review". The aim of this scoping review was to synthesize the results of any systematic reviews conducted between 2000 and 2010; the latter date being the year the review was carried out.

2.2.1 Scoping review questions

The review was guided by the following questions:

1. What is the evidence for the effects of MPM in preterm and/or LBW infants on their:
    a. physiological, behavioural and psychosocial health?
    b. breastfeeding and parent-infant interaction?
2. What gaps in current literature on MPM evidence exist that need to be addressed by a future review?

2.2.2 Methods of the scoping review

The method followed in the scoping review included: 1) stating the objectives of the review, 2) including reviews of Randomized Ccontrol Trials (RCTs), 3) identifying

studies with a pre-determined strategy that met inclusion criteria, 4) assessing the quality of included reviews, 5) focusing data extraction, 6) and a critical summary of the review (Glasziou et al., 2001; Arksey & O'Malley, 2005; Levac, Colquhoun, O'Brien., 2010).

2.2.3 Inclusion/exclusion criteria

The review only included systematic reviews that considered short and long term effects of MPM on preterm/LBW infants. Interventions with kinaesthetic stimulation or light touch alone were excluded since the focus of the review was MPM. However, if kinaesthetic stimulation or light touch were used in addition to MPM, they were included only if the results could be isolated. The decision as to whether or not publications should be included or excluded was made according to the criteria reported in Table 2.1.

Table 2.1: Scoping review inclusion/exclusion criteria

Criteria	
Include publication if it	Reports on a systematic review of RCTs Focuses primarily or partially on preterm and /or LBW infants Focuses on MPM (or touch combined with massage) Focuses on any outcomes physiological, clinical such as breastfeeding, behavioural or psychosocial such as parent-infant interaction
Exclude publication if it	Is not a review of RCTs Does not include preterm and /or LBW infants Is not primarily focused on MPM or touch in combination with massage Does not report data pertinent to outcomes of MPM intervention

2.2.4 Scoping Review search strategy for identification of reviews

The quality of the strategy sets the stage for a comprehensive search to capture all relevant studies. Using the right Boolean operators and nesting, truncation, "phrase search", and proximity search are important elements for a transparent and effective

capture. The following table 2.2 is a basic summary of Keywords/MESH terms used in this scoping search strategy.

Table 2.2: Search terms used for scoping review

(massage adj therap$).mp.
exp MASSAGE/
(therapeutic adj touch).mp.
exp TOUCH/ or exp THERAPEUTIC TOUCH/
(tactile adj stimulation).mp.
(infant$ or baby or babies).mp.
exp systematic review/
systematic review.m_titl.
literature review.mp.[mp=ti, ot, ab, nm, hw, kw, ui, an, tx, sh, ct, de, tn, dm, mf, tc, id]
literature review.m_titl.
review.m_titl.

The search covered systematic reviews or meta-analyses published between the years 2000 and 2010 exploring any outcome of MPM on premature/LBW infants. According to the Scottish Intercollegiate Guidelines Network 50 (SIGN) (2008), a 5-10 year limit for the search in a rapidly developing field may be appropriate. Therefore, studies before 2000 were not included as they were already included in the last systematic Cochrane review (Vickers et al., 2004). Reviews over 10 years old were considered out dated and might not relate to current practice. The search was limited to the English language because of lack of translation facilities. No other limits or filters were used. The databases searched were Ovid MEDLINE(R), EBM Reviews - Cochrane Central Register of Controlled Trials, EBM Reviews - Cochrane Database of Systematic Reviews, EBM Reviews - Database of Abstracts of Reviews of Effects, EBM Reviews - Health Technology Assessment, EBM Reviews - NHS Economic Evaluation Database, EBM Reviews - ACP Journal Club, EBM Reviews - Cochrane Methodology Register, EMBASE, MIDIRS: Maternity and Infant Care, PsychINFO, BNIA, and CINAHL (Appendix 1).

2.2.5 Data management and findings

2.2.5.1 Study selection

Searches in the databases were performed using the appropriate Key terms/Mesh terms (refer to Table 2.2). The same search terminology was used across the different databases. Inclusion and exclusion criteria were applied to ensure only relevant literature were included in the review (Table 2.1). Titles and abstracts from the initial search were appraised independently for potential eligibility by the lead reviewer (BA), as well as by the two supervisors (HW) and (CBJ) for their opinion to include or exclude (Appendix 2) for full text retrieval. At this stage there was no need to determine or resolve any disagreements as it was only a title capture of all potentially eligible studies. All titles and abstracts assessed as fulfilling the inclusion criteria were retrieved in full text in order to make a final judgment. Disagreement was resolved by discussion and consensus, or by consulting the primary supervisor (MJ).

Data were extracted from the review regarding: 1) The methods used; 2) The study aims; and 3) Key findings related to the research questions of the review.

2.2.5.2 Findings

Study selection was performed according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement (Liberati et al., 2009) as detailed in Figure 2.1 to ensure transparency and completeness of search.

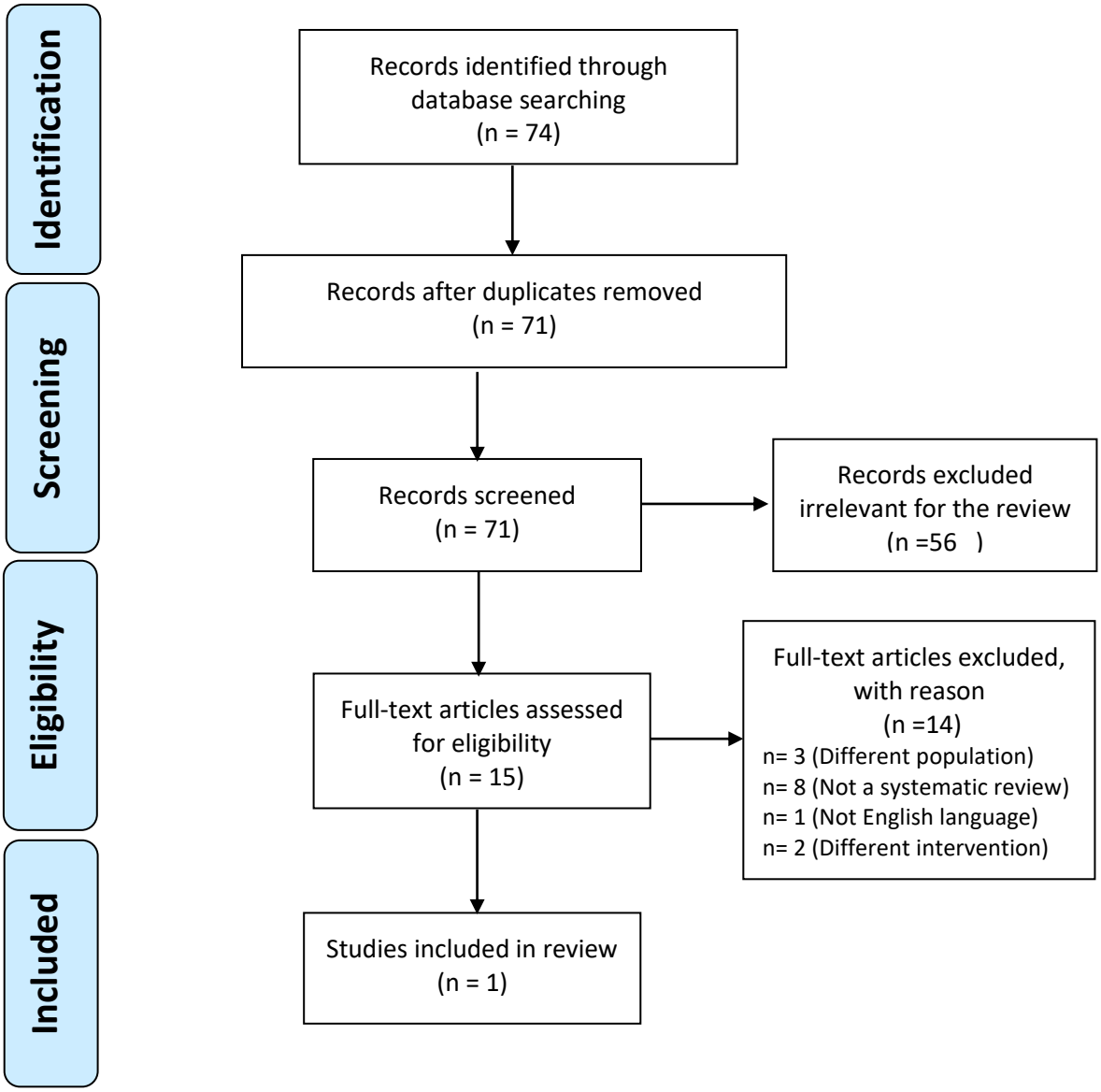

Figure 2.1: PRISMA 2009 Flow Diagram for the Scoping Review

Full-text copies of 15 selected papers were retrieved and checked independently by the researcher and the two supervisors for eligibility. Appendix 3 includes the final list of potentially eligible studies for inclusion/exclusion decision making after examining the full text article. At this point, only one systematic review "Massage for

promoting growth and development of preterm/LBW infants" by Vickers et al. (2004) met the inclusion criteria for the scoping review in which preterm/LBW infants <37 weeks and weight at birth < 2500g were randomized to receive MPM by human hands or to a control group.

2.2.6 Methodological quality assessment

The included review was assessed for methodological quality according to the Critical Appraisal Skills Programme (CASP) by Noyes, Popay, Pearson, Hannes, & Booth (2008) (Higgins et al., 2003; Oxman et al., 1994) (Appendix 4) and the Grading of Recommendations Assessment, Development, and Evaluation (GRADE) system of rating quality of evidence in systematic reviews (Guyatt et al., 2011a). The CASP is a standardized methodological quality assessment checklist of 10 questions. GRADE considers reviews of randomized trials relative to four levels; high, moderate, low, and very low. High-quality evidence may be reduced by one or two quality levels by limitations in the following areas: risk of bias, imprecision, inconsistency, indirectness, and magnitude of effect for each important outcome (Guyatt et al., 2011b) (Appendix 5). For instance, one of the most important of these risks being indirectness is of concern when differences exist between the population, the intervention, or the outcomes measured in relevant research studies and those under consideration in the systematic review (Guyatt et al., 2011b). Therefore, quality of evidence may decrease.

Guyatt et al. (2011a) propose that "The GRADE approach is applicable irrespective of whether the quality of the relevant evidence is high or low". It is used by critics of reviews to reach an in-depth understanding of the evidence (Guyatt et al., 2011a, p. 385). The GRADE and the CASP systems are complementary. In this scoping review, the GRADE system of rating quality was applied on the CASP questions to

assess and rate the quality of evidence in Vickers et al (2004) as shown in the following 10 questions:

1. Did the review ask a clearly-focused PICO question?

Population: There were major variabilities in the included studies in terms of the participants' profiles. Some included studies had LBW that might have also included very low birth weight (VLBW) and extremely low birth weight (ELBW), which have different characteristics (participants' weights that ranged from 800 to 2041gr). Including different population profiles within the selected RCTs might affect the outcome of the review in terms of growth and development: weight gain, length of stay (LOS), and neonatal complications.

Intervention: The massage/touch techniques, timing and frequency of massage interventions were variable among the studies; ranging from once per day for 10 minutes to three times per day for 20 minutes at each point in time. Some included studies did not meet the criteria for the applied intervention, i.e. systematic tactile stimulation by human hands. In one situation, Vickers et al. (2004) separated interventions that did not provide tactile stimulation such as gentle human touch (GHT) even though this was not planned in the original protocol. In another situation, the reviewers did not attempt to separate the studies with different interventions. For instance, in the case of the Rice Infant Sensorimotor Stimulation program (RISS technique). The intervention differed from massage intervention in that it encompassed three consecutive interventions: stroking, followed by rocking, holding and cuddling the infant. This variation relates to performance bias across the included studies. Additionally, the duration of intervention was also varied, ranging between a minimum of five days in some studies to until discharge in others. The fact that there is performance bias leads to more clinical heterogeneity in intervention effects among studies i.e. variation in effect estimates beyond chance **(**Schünemann et al., 2011). This

variation suggests rating down the quality of the review by one level from high to moderate.

Control group: All included studies in the review had similar control groups, i.e. standard care. Only one included study had three arms: massage, standard care, and a non-massage intervention (talking only).

Outcome: Outcome measures differed greatly among studies. The trials had to have at least one outcome assessing weight gain, length of stay, behaviour or development to be included by the Vickers et al. review (2004). Several outcomes were not reported by the Vickers et al. review (2004) such as: total number of parent visits; number of parent visits with touching/holding; and number of parent visits with feeding. This could lead to selective outcome reporting bias.

Although the Vickers et al. (2004) authors were aware of the discrepancies in the included studies regarding variation in massage technique and population, they did not attempt to subdivide the groups to perform subgroup analyses, possibly due to the limited number of eligible studies. This variability of population, interventions, and outcomes may be considered as a weakness in the method of the review which suggests rating down the quality of the review by one level from high to moderate.

2. Did the review include the right type of study?

The Vickers et al. (2004) review included 14 RCT studies out of 79 that had an appropriate study design in which allocation was randomized for different treatments and the assessed outcomes included at least one outcome assessing weight gain, length of stay, behaviour or development. The review included only studies that met both the criteria for LBW or prematurity and were graded either for adequate (A) or unclear (B) concealment of treatment allocation. This strengthens the review as lower quality designs are usually associated with a higher risk of bias.

3. Did the reviewers try to identify all relevant studies?

The authors of the review defined massage and restricted study inclusion to all relevant RCTs from 1983 till 2003. It included all relevant published randomized control trials (RCTs); ranging from the Cochrane Library, MEDLINE, EMBASE, Psychlit, CINAHL and Dissertation Abstracts International to citation tracking and checking personal files with no language or time restriction. The authors also contacted experts in the field and checked personal files when necessary thus strengthening their review.

4. Did the reviewers assess the quality of the included studies?

Four methodological criteria were used to appraise each paper based on concealment of treatment allocation, performance bias, blinding of observers, and exclusions/ withdrawals bias or attrition bias. A clear, pre-determined strategy was used to decide which studies were to be included. Eight of the 14 included studies were in category A with a low risk of bias. Selective reporting of outcomes was noted in 6 studies, and was reported by the reviewers accordingly which suggests rating down the quality of the review by one level from high to moderate.

5. If the results of the studies have been combined, was it reasonable to do so? Heterogeneity or consistency of results

All 14 included studies were tested for unexplained heterogeneity or inconsistency of results that could not be attributed to chance (Webb & Roe, 2007; Deeks et al., 2011). Out of the studies, six were combined for weight gain and LOS outcomes. For other outcomes, two or three studies were combined; for instance: neonatal complications and Brazelton behavioural scales. The remaining studies were

excluded from combination due to small sample size to prevent prognostic imbalance (Guyatt et al., 2011c). This approach served to provide more reliable conclusions.

6. How were the results presented and what was the main result?

In the short term, infants who received a tactile massage intervention with kinaesthetic stimulation (T/K) gained more weight per day than infants in the control group as well as a decreased length of hospital stay as reported in the forest plots.

The main result from the forest plot by Vickers et al. (2004) shows that when the data from 6 studies were combined, significantly greater weight gain was achieved by the intervention group (n=139) compared to the control group (n=135): weighted mean difference 5.06 g; 95% confidence interval (CI) 3.45 to 6.67; Z=6.15 (P<0.00001). However, the confidence intervals for the results of the individual studies have poor overlap; which generally indicates the presence of statistical heterogeneity. In addition, the reported participants' initial weights in the review ranged from 800 to 2041g. with considerable variation between the included studies. There were concerns about selective reporting bias in many of the included studies such as White-Traut et al. (1999), where conclusions were made for LOS (statistically significant) but not for weight gain, only reporting the positive results. These varied characteristics across the included studies affected the outcome measures of the review as mentioned previously and led to clinical and methodological heterogeneity. As a consequence, the combination and overall results of the meta-analysis should be interpreted with caution.

In the longer term of four to six months, there was a slight, but not significant reduction of neonatal complications. Although this slight reduction was not statistically significant, it is an important clinical finding that is worth future investigation. In conclusion, study results were statistically combined in a meta-analysis whenever it was possible thus strengthening the review.

7. How precise are these results? Imprecision (validity of results)

The six included studies comparing massage versus routine care on daily weight gain were small studies (sample size ranging from six to 43). Smaller studies tend to give less precise estimates of effect and have wider confidence intervals than larger studies. In this case, the results were not very precise. Similarly, the decreased LOS outcome by 4.5 days 95% CI; 2.4 to 6.5 was strongly influenced (52% of weighting) in one study by White and Labarba (1976) which had a small sample size (n=12). When Vickers et al. (2004) reanalysed the data excluding this study from the meta-analysis, the CI was wider with a mean reduction in LOS to 5 days, 95% CI; 2.0 to 7.9 revealing no significant effect on the sensitivity analysis. Yet, a decrease of 4.5 days is of considerable value statistically and clinically despite the concern about small sample size in many of the included studies. However, caution needs to be exercised in interpreting the results as LOS can be affected by other factors e.g. pressure on cots or infant ability to feed, noting that every hospital has its own discharge protocol.

8. Can the results be applied to the (Lebanese) local population?

Despite the small number of studies and some limitations such as variations in the massage technique that might reduce confidence in estimates of effect in the review findings, the results of the Vickers et al. (2004) review are promising. It is worth noting that the application of massage in Lebanon is considered appropriate as indicated by the quasi-experimental pilot study conducted by this author in Lebanon (Abdallah et al., 2013) on the use of preterm/LBW infant massage as a therapeutic intervention.

9. Were all important outcomes considered?

Most important outcomes at the individual level were considered and reported in the review such as weight gain, length of stay, head circumference, neonatal

complications, positive outcome on Brazelton behavioural scales, and mental and motor scores. However, other outcomes that might be of concern to HCPs and parents such as breastfeeding, parent-infant interaction and care-giver or parental satisfaction as well as contextual issues such as process-of-care outcomes were not reported. This could potentially reduce the quality of the review by one level from high to moderate.

10. Should policy or practice change as a result of the evidence contained in this review?

Policy or practice should not be changed as a result of the evidence contained in the review because effect sizes were of low clinical significance. Other outcomes of importance that were not included in the Vickers et al. (2004) review relate to the barriers and facilitators for MPM implementation including cultural, contextual and organizational factors. Additionally, the environment of the studies included in the Vickers' review might be different than the Lebanese context. Nevertheless, there was no reported risk or harm from the massage intervention. Even the minor clinical significance in weight gain and decreased LOS for this vulnerable population should be critically considered by policy makers as it has the potential to reduce the cost and morbidity associated with hospital stay. This evidence should encourage future investigations of larger sample size. According to Vickers et al. (2004), further research is needed to evaluate the effects of massage on premature/LBW infant clinical outcomes. Overall, the Vickers' review was of moderate quality as detailed later in section 2.2.8.

2.2.7 Results

The main results showed that infants who received the massage intervention gained more weight per day (weighted mean difference 5.06 g; 95% confidence interval

(CI) 3.45 to 6.67; Z=6.15 (*P*<0.00001)), and had decreased LOS (weighted mean difference -4.45 days; 95% CI -6.48 to -2.43; Z=4.3 (*P*=0.00002)) than the control group. Over a longer term, 4 to 6 months, there was a slight, but not significant reduction of neonatal complications that is worth future investigation. However, most of the included studies targeted nurses and physical therapists as providers of care with limited involvement of parents in administering the massage. These studies were conducted mainly in resource rich countries with short-term follow-up limited to the first year of life.

According to Vickers et al. (2004), massage is likely to be safe with no report of negative effects on the target population.

2.2.8 Strengths and weaknesses of the Vickers et al. (2004) review

2.2.8.1 Strengths

Trials were excluded if the randomization was not concealed. Attempts were made by the reviewers to contact authors for further information on allocation if it was not stated clearly in the trial, in cases of missing data or to inquire for further clarification in relation to withdrawals or drop-outs.

2.2.8.2 Weaknesses

The reasons for heterogeneity i.e. inconsistency in results across studies were not clearly identified and the authors of the review did not generate new hypotheses about particular subgroups. The existence of clinical and statistical heterogeneity implies that there might be a distribution of intervention effects rather than a single intervention effect. Factors that decreased the quality of the Vickers et al. (2004) review were: no attempt to subdivide the groups in order to perform subgroup analyses due to the low number of RCTs; selective reporting bias in many of the included studies such

as length of hospital stay in Wheeden (1993) and weight gain in White-Traut et al. (1999); and the imprecision of results due to small sample size and the wide confidence intervals in many of the included studies lowered the rating of the quality of evidence.

2.2.9 Discussion and conclusion

This scoping review provided an assessment of one Cochrane review on the topic of interest. It partially answered the review question (RQ1a) related to the evidence for the physiological and behavioural health effects of MPM on preterm and/or LBW infants. However, it did not provide an answer to the review question pertaining to the effects of massage on breastfeeding and parent-infant interaction (RQ1b). The 14 included studies were RCTs with a small sample size, low to moderate quality appraisal, and moderate to high heterogeneity. There is a need to further evaluate the effects of massage on growth and development, psychosocial health, breastfeeding, and parent-infant interaction in preterm and/or LBW infants.

RCTs on infant massage over the last few decades have revealed strong indicators for positive effects on growth and earlier discharge (Vickers et al., 2004). However, methodological issues in relation to small sample size, the uniformly positive results in most RCTs and performance bias in several of the studies have been noted.

Gaps in current literature/evidence that need to be addressed by a future review were identified (RQ2). The Vickers et al. (2004) review did not report the contextual characteristics of the included studies. The intervention effectiveness might differ depending on the context, culture and resources used across settings for a particular intervention, which limits the applicability of findings to other settings. According to Guyatt et al. (2011b), p. 1305, "There may be important differences in implementation across settings that can weaken inferences regarding applicability". The review did not address the cultural, organizational or contextual factors of the included studies limiting

the applicability and transferability of the interventions. This causes a major issue for lower income countries. Although several studies explored the effect of touch and massage on the preterm/LBW infants' growth and development, very few actually explored its long-term effect when performed by parents on breastfeeding, parent-infant interaction, and process-of-care outcomes.

In conclusion, the scoping review revealed evidence for only a very limited range of outcomes, the strength of the evidence was weak, and many studies were underpowered to detect a difference. Many issues that could be important to parents, nurses and health care organizations were not examined as outcomes or process variables. New studies, however, have been published on infant massage and warrant evaluation for greater clarity on the estimation of effect, strength of evidence, and additional outcomes of the intervention on the target population.

2.3 Second Review: An Integrative Review of Infant Massage

2.3.1 Justification for using an integrative review

When evaluating complex interventions, the Medical Research Council (Craig, Dieppe, Macintyre, Michie, Nazareth, & Petticrew, 2008) emphasizes the importance of the early phases of developing an intervention by identifying the evidence base from all aspects and developing the theory prior to testing it. These issues are very important to allow a more focused exploration of empirical and naturalistic research about infant MPM and the factors that may facilitate or impede the implementation of this technique in the NICU. Evidence to identify the barriers and facilitators to the implementation of infant MPM in the NICU is needed. This evidence could provide much-needed information about the design and implementation of clinical trials in the field of MPM and facilitate the development of a conceptual framework for future policy and research. In light of the MRC framework (Craig et al., 2008) and modelling stages, the

gaps noted in the scoping review lead to the need for a further more general review including qualitative and quantitative studies.

An integrative review (IR) is a mixed methods approach to systematic reviews (Whittemore & Knafl, 2005). It is a class of research that combines all types of research designs, methods and modes of analyses into a single review. These designs are complementary; each will reveal different aspects of reality (Webb & Roe, 2007). Using an IR is recommended by many researchers since it has great potential to clarify and unify science as well as make research more accessible to clinicians by highlighting important issues that research has left unresolved (Kirkevold, 1997; Webb & Roe, 2007; Whittemore & Knafl, 2005, Gough, Oliver & Thomas, 2012, 2017).

2.3.2 Problem identification, purpose and review questions

The aim of this IR was to extract, appraise, summarize and synthesize research evidence on preterm and/or LBW infant MPM in NICUs using a systematic approach. The objectives are to examine the evidence of the effects of infant MPM on preterm/LBW. Additionally, the mechanisms of action (MOA) of MPM and the evidence for the effectiveness of MPM on preterm/LBW infants and key stakeholders (specifically parents and healthcare providers) will be evaluated. This review should also help in gaining insight on the barriers and facilitators of MPM implementation in NICUs. Building upon the scoping review, the current IR has specifically focused questions to understand the issues surrounding the context in the design of any RCT of MPM.

2.3.2.1 Review questions

Based on the gaps identified in the scoping review, the following questions were proposed:

1. What is the evidence of the effects of infant MPM on preterm and/or LBW infants?
    a. physiological (weight gain, head circumference)
    b. behavioural (mental, motor and behavioural scores)
    c. psychosocial (parent-infant interaction)
    d. clinical (breastfeeding and length of stay)
2. What are the mechanisms of action and underlying theories regarding infant MPM?
3. What are the facilitators and barriers in relation to the context when implementing MPM techniques on preterm and/or LBW infants in NICU?
4. What gaps exist in current MPM theoretical and empirical literature that need to be addressed by future study?

2.3.3 Methods/review protocol

The protocol of this IR followed the steps described in Webb and Roe (2007) and the CRD's Guidance for Undertaking Reviews in Health Care (Tacconelli, 2010). It applied a methodical process of data collection; identifying, selecting, appraising, and synthesizing research evidence relevant to a specific research question (Gough et al., 2012; Higgins & Green, 2011). The criteria for meta-analysis were planned in this review following the method described in the Cochrane Collaboration Handbook (Higgins & Green, 2011). However, it was not performed because of the heterogeneity of the included studies and the Wang et al. (2013) meta-analysis relative to this topic being released at the same time. Therefore, the focus was shifted to carry out a qualitative data synthesis instead of the meta-analysis (Appendix 17). In this way, the gap was still able to be assessed and identified. This approach established the

foundation and justification for the empirical study. The results of the IR were summarized, synthesized and presented according to the following structure.

2.3.4 Locating studies for the integrative review using the PICOS framework

To locate studies, a very broad approach was used to uncover a range of different study designs relevant to the review (Webb & Roe, 2007). A search was undertaken for existing systematic, meta-analysis, meta-synthesis and IRs performed for infant MPM. Only primary studies of interest were included in the review and were tracked as initial sources or through other reviews. The studies in the IR were limited to those between the years 2000 and 2012. Studies included were also limited to the English language because of the lack of translation facilities given that this review was part of a doctoral dissertation that was not funded.

The PICOS framework was used in searching the literature for both quantitative and qualitative studies. The population (P) of interest was preterm/LBW infants; the intervention (I) was MPM; the comparators (C) might be no intervention, or other treatment options such as routine or standard care. The outcomes (O) of interest were any physiological, behavioural, clinical, and/or service related outcomes such as: weight gain, parent infant interaction, breastfeeding initiation and duration, and length of stay. For qualitative studies, CO was social and physical context of the intervention. The study design (S) included quantitative and qualitative study designs. The different study designs were needed to adequately address all the questions of this review. However to be noted, this method of combining Population and Intervention from the PICOS created a cumbersome number of studies retrieved.

2.3.4.1 Search strategy

The starting point was to search the Database of Abstracts of Reviews of Effects (DARE) and the Cochrane Database of Systematic Reviews (CDSR) for existing or on-going reviews on the topic before undergoing this review. The following 12 databases were searched: MEDLINE/PUBMED, CINAHL Plus, Cochrane CENTRAL, psych articles, Maternity and Infant Care, *Journal Storage* JSTOR, Web of Knowledge, ZETOC, SCOPUS (Elsevier @ UOB), Dissertation Abstracts databases, Wiley Online Library and Google scholar. The search also covered bibliographies of selected print articles, books and journals browsing the UOB and UOD library, the OPAC online library catalogue, and the OLIB Webview from UOB. Print articles, books and journals were located as well as other sources such as: reference lists of Neonatal Network Journal, Journal of Neonatal Nursing, Journal of Obstetric, Gynaecologic and Neonatal nursing, Paediatric Nursing, American Journal of Maternal/Child Nursing, Journal of Perinatal & Neonatal Nursing, Journal of Paediatrics and Prenatal and Neonatal Medicine. The choice of these 12 databases was done after consulting with medical librarians at both UOD and UOB to benefit from their expertise and verify the thorough capture of journals with relevant literature on MPM. The search also covered publications from the International Association of Infant Massage (I.A.I.M) and Touch Institute websites, research and development databases, and the Scottish National Research Register (Scotland research body) for any funded research on infant massage. "Snowballing" by reference and citation tracking was performed using the citation databases: Science Citation Index, Social Sciences Citation Index, and Arts and Humanities Citation Index. Other methods also used were: reference lists of included studies and other similar systematic reviews, contact with experts in the field, hand searching specific journals, and Google.

Study selection criteria were necessary to improve the rigour of the review and were agreed upon between BA, MJ, HW, and CBJ to avoid missing any relevant study (Cooper, 1998; Conn et al., 2003) (Refer to Table 2.2).

2.3.4.2 Keywords /MeSH terms used

First, the lead reviewer (BA) searched for the population of interest which is "preterm" and/or "LBW" infant, and the intervention which is "massage" without specifying the study type. A combination of text terms and MeSH terms (see below) was used to maximize the volume of literature retrieved for a complete capture of research evidence relevant to the research questions. Keywords/ MeSH headings used: for the concept "massage" AND "infant"; MEDLINE was searched through PubMed, using the MeSH terms and keywords listed as the details of searches in Appendix 6. The results were filtered according to "massage" AND "infant" and duplicates were then removed. Keyword searches and their derivatives were performed on CINAHL, JSTOR, POPLINE, Cochrane, PsycINFO and MEDLINE (MeSH terms were used in addition to keywords) with search terms expanded when applicable (such as: (touch OR massage) AND ("Infant, Premature"[Mesh]) OR ("Infant, Low Birth Weight"[Mesh])) in April 2012 (Appendix 6).

The initial search was very general to achieve a maximum capture. However, no qualitative studies were located. Therefore, other terms were used to locate qualitative studies were: focus groups, in-depth or semi-structured interviews, and thematic, content, or framework analyses. Likewise, it was also helpful to search reference lists of relevant studies. Results were exported from each database to RefWorks, when applicable (CINAHL; Medline; Dissertation Abstract; Google Scholar; PsycArticles; Scopus integrative; and Wiley Online Library integrative), and separate folders for each database were created. Duplicates were then removed. Finally, the results were

exported as tab delineated, saved as text documents, and copied and pasted to an excel sheet. Results from databases where RefWorks was not an option for export, were saved in word documents, and then added to the same excel sheet (Cochrane CENTRAL, Web of Knowledge, and ZETOC). The process of collating search results is presented as a selected example in Appendix 8.

2.3.5 Criteria for study selection

Studies were included or excluded according to the criteria detailed in Table 2.3.

Table 2.3: Integrative review inclusion/exclusion criteria

Criteria	
Include if publication has the following characteristics:	1. Population: Focuses primarily or partially on preterm (ie: less or equal to 37 weeks' gestation) and /or LBW infants (weighing at least 1500 gram but less than 2500 gram at birth) 2. Context: In NICU 3. Intervention: Focuses on MPM (Appendix 9) or massage combined with kinaesthetic stimulation. 4. Comparator: routine / standard care or no intervention, or other treatment options. 5. Outcome: Focuses on any physiological, clinical, behavioural or psychosocial outcomes 6. Study Design: Study is original; reporting primary data both quantitative and qualitative. 7. Published between January 2000 and 2012 8. English language.
Exclude if publication has the following characteristics:	1. Population: Full-term infants >2,500 g; Very Low Birth Weight: VLBW (Birth weight <1,500 g); Extremely Low Birth Weight: ELBW (Birth weight <1,000 g) 2. Context: not in NICU 3. Intervention: Massage was not the intervention or one of the interventions. 4. Does not report data pertinent to outcomes on physiological, behavioural and clinical or service related outcomes of massage intervention such as weight gain, parent-infant interaction, breastfeeding initiation and duration, and length of stay 5. Study Design: Is a review, editorial or opinion, book, book chapters, working paper, unpublished study, policy document or report 6. Not published in the English language.

2.3.5.1 Selection of studies

After removing the duplicates, screening the search results of each citation with titles and abstracts was performed in parallel. BA reviewed all results and HW, CBJ, MJ each independently reviewed a portion creating a complete cross check. Each citation was therefore independently reviewed by two reviewers without knowing what the other person decided, to increase the validity (Appendix 10). At this step, even with an overlap in decision there was no need to determine or resolve disagreement as this was still at the title/abstract phase. Therefore, the full text of any citation judged as potentially eligible by at least one of the two reviewers was included to be sensitive so as not to omit any study (Appendix 11). A screening guide was used based on inclusion and exclusion criteria (Table 2.3), typically with questions on: Population, Intervention, and Control and for qualitative studies only on Population and Intervention. Further details in relation to the reasons for excluding the remaining studies are in Appendix 14. Abstracts of the excluded studies were kept for later use in the discussion (White & Schmidt, 2005) for their insights on the barriers and facilitators for similar touch-based interventions in the NICU.

The decision as to whether or not the publication was included or excluded was made according to the criteria reported in Table 2.3. Full-text copies of all retrieved papers were obtained and checked independently by the researcher and one of two supervisors for eligibility using a standardized form with explicit inclusion and exclusion criteria (Appendix11). The third supervisor was excluded in the process in case disagreement was not resolved, to provide an objective resolution. Removed publications with reasons of exclusion were recorded independently by the two reviewers after sifting through the publications (Appendix 14). Duplicate publications of the same study were linked together to prevent introducing bias if included more than once. The two reviewers resolved any disagreements concerning the inclusion of

articles by discussion and consensus (level of disagreement was less than 20%). After consulting MJ as a third supervisor as to whether to include studies with oil application only or limited massage targeted to only one area of the body for the intervention massage, the decision was made to include only studies focusing on full body massage including tactile stimulation (TS) and T/K stimulation with or without oil.

The process of study selection was performed according to PRISMA (Liberati et al., 2009) and is detailed in the flow diagram of Figure 2.2.

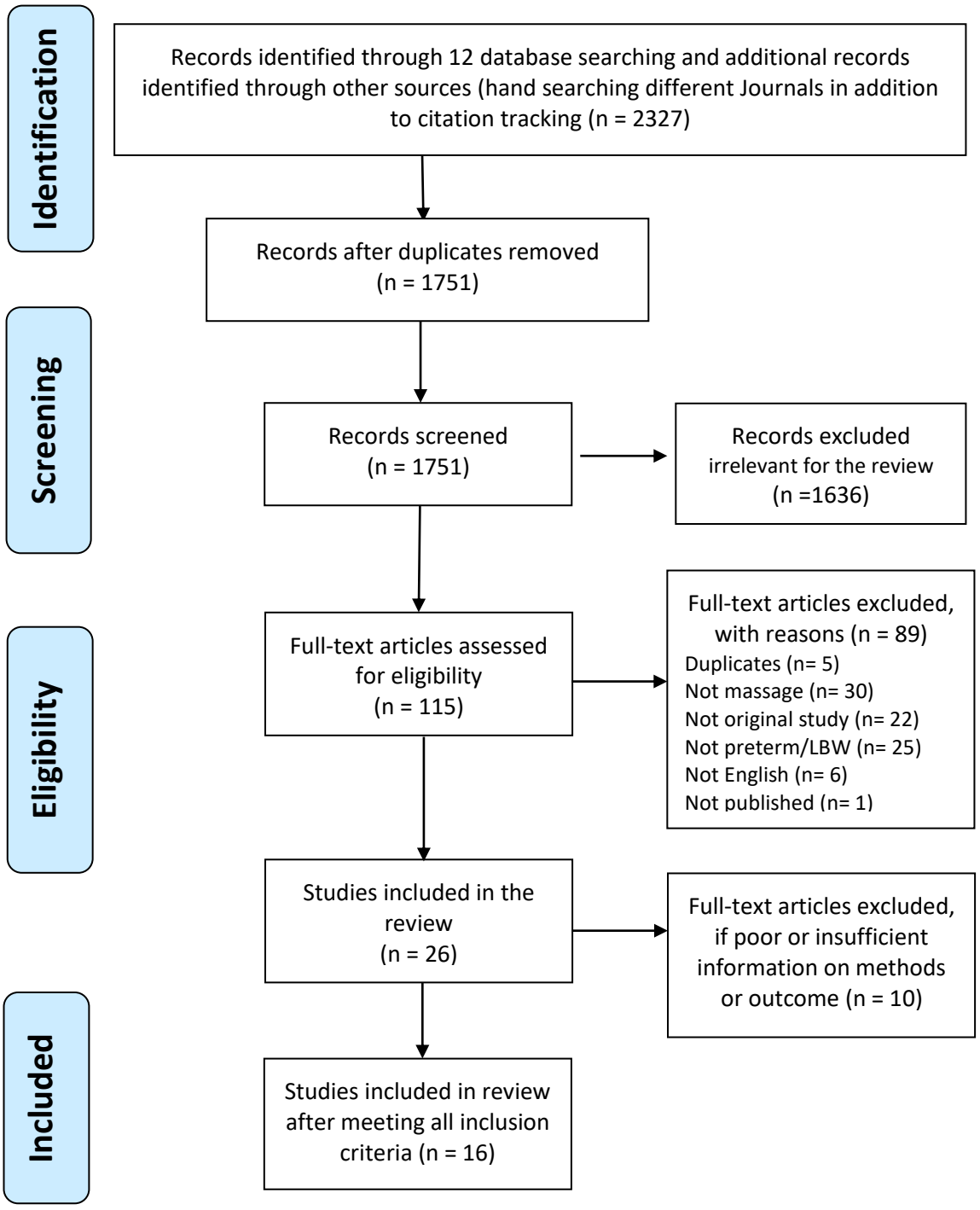

Figure 2.2: PRISMA 2009 Flow Diagram for the Integrative review

2.3.6 Data extraction and management

A form was designed and piloted for data extraction. The scope of this review was broad resulting in an inclusive and sensitive search results. The search included intervention and non-intervention studies, stratified into RCTs and non-RCTs to be appraised, with the non-RCTs being stratified further by study design. A consolidated

form was used to incorporate the data into one form to facilitate the data extraction process.

Data were extracted and assessed regarding: 1) methods; 2) aims; and 3) key findings. In this stage, BA reviewed 100% of the extracted papers. Data from included studies were cumulated using paper data extraction sheets by BA and two supervisors independently for the first 20% of the included papers (Appendix 11) to minimize transcription errors in data coding (Webb & Roe, 2007). According to the method reported by Schlosser (2007), if there is a high level of agreement between reviewers (80-100%) for the first 20 to 30% of the papers, the rest of the data were extracted by one reviewer and then checked by the second reviewer. Disagreements were resolved by discussion with a third supervisor. Data collection forms for descriptive mapping of relevant studies, such as tables or matrices to ensure complete documentation of relevant data, were used (refer to Appendix 11). These forms were piloted with several primary sources and mapped directly to review questions. The forms included study details, participant demographics, geographical location, time frame, research design, and an assessment of the quality using a methodological quality assessment form (Webb & Roe, 2007). The forms helped the reviewers to examine the type of data extracted for data synthesis and to reflect on the differences and/or similarities in the included studies (Appendices 12 and 13). Authors were contacted to discuss 'missing' data or to inquire about withdrawals or drop-outs that might impact the quality rating; for example: Field et al., (2008); Vaivre-Douret et al., (2009); Teti et al., (2009), Saeedi et al., (2011). However, only Field and Vaivre-Douret out of the four contacted authors responded with the missing data.

In the next section, the study characteristics and findings for the included studies are discussed. Then critical appraisal was carried out using a checklist (Appendix 12) to

identify flaws in studies that could bias the results. Data were reported and highlighted for any similarities, differences, and/or reasons for variation.

2.3.7 Results section

2.3.7.1 Study characteristics and findings for the included studies

At the end of title and abstract screening, 115 citations assessed as fulfilling the inclusion criteria by at least one of the reviewers were retrieved in full in order to make a final judgment about their inclusion. All of these papers were assessed; 26 papers met the inclusion criteria, but only 16 were of sufficient quality. At this point 10 were excluded due to insufficient information on methods, outcomes or judged to be of poor quality. The studies varied widely in terms of the participants, massage provider, intervention, context and study outcomes. The section below summarizes the PICOS and key aspects of the main results of the 16 RCTs (refer to Table 2.4). Although the search was broad, no qualitative or observational studies were identified that fit the inclusion criteria due to being VLBW, not preterm, or not a NICU setting.

Ten studies out of the 16 were parallel designed clinical trials (Aly et al., 2004; Field et al., 2008; Gonzalez et al., 2009; Guzzetta et al., 2011; Kumar et al., 2012; Moyer-Mileur et al., 2013; Saeedi et al., 2011; Smith et al., 2013; Teti et al., 2009; Vaivre-Douret et al., 2009); two studies were of a factorial design (Fucile & Gisel, 2010; Fucile et al., 2011), while the remaining four studies were of a randomized complete block design (Ang et al., 2012; Ferber et al., 2002; Ferber et al., 2005; Sankaranarayanan et al., 2005).

Table 2.4: Study Characteristics and Findings of Included Studies (Appendix 16 for more methodological details on the included studies)

ID	Author (date) Country	Design	Population*	Intervention	Outcomes	Main results
1	Aly et al., (2004) Egypt	RCT Parallel design Double-blinded	N=30 IG=15 CG=15 GA = 28 - 35 weeks BW= 1200-1700 g Medically stable	Massage therapy** protocol adapted from Field et al., (1986) with KS (massage included 12 strokes for 5 min provided by a physician 3times daily, 5 days per week. <u>For how long</u> Not specified until the infant reached 1.8 kg	Bone formation assessed by serum marker: propeptide of type 1 collagen (PICP) & urinary marker pyridinoline (Pyd)	IG serum PICP increased over time from 62.5± 13.8 to 73.84±12.9 ($p<0.01$). Urinary Pyd also increased over time from 445.7±-266.5 to 716.8±-301.8 ($p<0.01$). Controlling for GA, serum PICP increased significantly in the intervention group (regression coefficient 18.8± 4.6, $p=0.0001$) Urinary Pyd did not differ between groups
2	Ang et al., (2012) USA	RCT Triple blinded Complete Block Design	N=120 IG=58 CG= 62 GA:28 - 33 weeks BW: 600-1800 g Medically stable	Massage therapy protocol adapted from Field et al. (1986) performed by trained neonatal research nurses TS + KS 3 times daily for 15 minutes each, 5 days per week. <u>For how long</u> Over 4 weeks or until hospital discharge (whichever came first	<u>Primary outcome:</u> Immunologic evaluations: absolute NK cells <u>Secondary outcomes</u> -Weight gain - LOS - Number of culture-proven infections	Absolute NK cells not significantly different between groups NK cell cytotoxicity was higher in the IG vs CG (13.83 LU; 95% CI, 11.42–16.23) IG were heavier (2178 ± 548 vs 1999 ± 284, $p=.05$) & had higher daily weight gain (15.37 ± 3.85 vs 14.99 ± 2.98, $p=.04$). Other outcomes NS.
3	Ferber et al., (2002) Israel	RCT Cluster design	N =57 IG1= 21 IG 2= 17 CG = 19 GA 26 -34 weeks BW > 600g - <2200g Medically stable	Massage therapy protocol adapted from Field et al.(1986) without KS for 15 min, 3 times daily 20 min after the end of feeding IG1: Mothers applied massage IG2 : Research assistant applied massage <u>For how long</u> 10 days	<u>Primary outcome</u> Weight gain (gm) <u>Secondary outcome</u> Caloric intake	IG1 and IG2 has significant increase in weight (291.33 ± 95.54, 311.35 ± 86.48 vs CG 225.52 ± 109.74, $p=0.03$) Calorie intake process was apparently more efficient in the treated groups than in the control groups. *Caloric intake lower for IG 1 and IG 2 compared to CG* (U= 136.0; P= 0.03), *(U*=86.00*; P*=0.006*)*

4	Ferber et al., (2005) Israel	RCT Cluster design	N =51 IG1= 19 IG 2= 15 CG = 17 GA 26 -34 weeks BW > 600g - <2200g Medically stable	Adapted with modification from Field et al. (1986) without KS for 15 min, 3 times daily 20 min after the end of feeding IG1: Mothers applied massage IG2 : Research assistant applied massage <u>For how long</u> 10 days	Mother –infant interactive behaviours at 3 months 1) Maternal sensitivity 2) Child social involvement 3) Dyadic reciprocity 4) Maternal intrusiveness	Mother–infant interactions were more optimal in the treated groups compared to controls (Wilks' Lambda F (4,46) = 2.37, p = 0.023). Three out of the four interactive composites in the 2 intervention groups were better than the CG (Social involvement, maternal intrusiveness & dyadic reciprocity) No difference if massage was given by mothers or staff
5	Field et al., (2008) USA	RCT Parallel design	N=42 Low SES Number in each arm not specified GA mean 29.5 BW mean 1236 g GA at time of study 34.6 wks. Medically stable	Massage therapy protocol by Field et. al., (1986) 15 minutes, 3 times per day, for 5 days by physical therapist <u>For how long</u> 5 consecutive days	serum insulin and serum IGF-1 Vagal activity	IG had higher weight gain (g) (−.47 for CG; + 13.6 for IG; p=0.02); IG had a greater increase in insulin 0.95 vs 0.42 (p= 0.001); IG had a greater increase in IGF-1 (p= 0.05) -Vagal activity increased during the Massage therapy (M= 3.85 to M = 4.30, p<0.001).
6	Fucile & Gisel, (2010) USA	RCT Factorial	N=75 IG1=19 Oral stimulation, IG2= 18 T/K IG3= 18 Oral +T/K CG=20 GA stratified (26–29 and 30–32 weeks) BW mean = 1340 g ±52.5 Medically stable	Massage therapy protocol by Field et. al., (1986) applied by researcher (10 minutes of TS) + 5 Minutes of KS for a total of 15 minutes, 2 times a day. The oral intervention consisted of 2 times daily stroking of the cheeks, lips, gums, and tongue for 12 min and non-nutritive sucking for 3 min <u>For how long</u> 10 days	Mean daily weight gain in (g/kg/day), for two periods, -Time 1=from first to last day of intervention -Time 2=from last day of intervention to hospital discharge Infant Motor Performance (TIMP)	- IG1 and IG2 groups had significantly higher mean daily weight gains than those in CG period at Time 1(17.4 ± 6.1 & 17.6 ± 3.8, vs 15.7 ± 4.6 &12.6 ± 5.9, $p \leq 0.014$. - IG2 and IG3 had significantly higher motor scores than those in the IG 1 & the CG (36.7 ± 4.0, &36.9 ± 4.7 vs 34.6 ± 4.5, & 30.2 ± 8.2 p ≤0.033).
7	Fucile et al., (2011) USA	RCT Factorial	N= 75 IG1=19 Oral stimulation, IG2= 18 T/K IG3= 18 Oral +T/K CG=20	Massage therapy protocol by Field et. al., (1986) applied by researcher and included TS + KS for a total of 15 min, 2 times per day. Oral intervention consisted of twice-daily stroking of the cheeks, lips, gums, and tongue	<u>Primary outcome:</u> Time to attainment of independent oral feeding <u>Secondary outcomes:</u> -proficiency (intake in the first 5 min), volume	IG 1, 2 & 3 achieved independent oral feeding 9–10 days earlier than CG (p<0.001). Proficiency, volume transfer, overall rate of transfer were all significantly higher in the 3 IGs (p <0.01). --IG 3 attained independent oral feeding at

			GA stratified (26–29 and 30–32 weeks) BW mean = 1340 g±52.5 Medically stable	for 12 min and non-nutritive sucking for 3 min by physical therapist <u>For how long</u> 10 days	& rate rate of transfer (mL/min), & volume loss -LOS	a significantly earlier than CG (p = 0.020) LOS not significantly different
8	Gonzalez et al., (2009) Mexico	RCT Parallel design	N=60, IG =30, CG =30 GA 30-35 weeks, BW= ?? Medically stable	Vimala Mclure (2009) massage protocol administered by parents, trained by one investigator 15-20 minutes, 2 times per day <u>For how long</u> 10 days	Weight gain LOS	IG gained significantly more weight over the 10 days (29.2±5.3 g vs 20.9±7.6, (p<0.001). By day 10 IG gained a mean of 188.2±41.20 g/kg vs 146.7±56.43 g/kg for the CG (p<0.001). IG LOS was shorter (15.63±5.41 vs 19.33±7.92 days, p=0.03).
9	Guzzetta et al., (2011) Italy	RCT Parallel design	N=20 IG=10 CG=10 GA 30-33 weeks BW = ? Between the 25th and 75th percentile No or minor abnormalities on ultrasound	Massage therapy by Field et al (1986), started on postnatal day 10 (±1). TS + KS 3times daily for 15 minutes Applied by expert therapist <u>For how long</u> 10 days with a 2-day rest interval after the 5th day	<u>Primary outcome</u> Brain maturation Electro-encephalography -(EEG) activity at 1 week before massage and 4 weeks after massage	IG had higher global spectral power in the delta band (F1,15=4.7, p=0.046), and in the beta band (F1,15=4.8, p=0.044) May suggest a positive phenomenon of brain maturation
10	Kumar et al., (2013) India	RCT Parallel design	N= 48 IG = 25 CG =23 BW = <1800 g, GA <35 wk. Age at enrolment = 48h Medically stable	Massage therapy protocol adapted from Field et al (1986) without KS and for 10 min, 4 times per day with 2.5 ml/kg of sunflower oil per massage performed by mothers trained by therapist <u>For how long</u> For 4 weeks	<u>Primary outcome</u> Weight at 28 d after enrolment into the study <u>Secondary outcomes</u> length and head circumference Serum triglyceride levels	IG had higher weight gain (476.76± 47.9 g vs 334.96± 46.4 (p<0.05). No significant difference in serum triglycerides and other anthropometric parameters.
11	Moyer-Mileur et al. (2013) USA	RCT Parallel	N=44 IG= 22, CG =22 Standard care GA = 28 -32 weeks BW=?	Massage adapted from (Mclure, (2009) -The massage was performed by 9 licensed massage therapists for 20 minutes twice daily at 7:00 a.m. and 7:00	<u>Primary outcome</u> Anthropometric measures: weight, length, body circumferences (head, abdominal, mid-upper	No difference in weight gain or IGF-1, & leptin Circulating adiponectin increased over time in CG male infants compared to the IG (10.3 ± 2.0 vs 34.8 ± 11.0, p < .01)

			Between 10th and 90th percentile	p.m., 6 d/wk. -The massage and control treatments were performed behind privacy screen by a licensed massage therapist For how long for 4 weeks	arm, and mid-thigh. Triceps skinfold thickness & Ponderal Index Secondary outcomes Enteral feeding volume Body fat deposition Circulating IGF-1,leptin and adiponectin levels	
12	Saeedi et al., (2011) Iran	RCT Multi-arm Parallel design	N=73 IG1=25 IG 2=23 CG=25 GA 27-37 weeks Medically stable infants	TS as per the procedure described by Mathai *et al* (2001), at 2-10 days of life. IG1 massage with 4ml of oil by trained personnel 5 min four times/day IG2 same as IG1 without oil For how long for 7 days	Weight gain	IG1 weight gain (212.40±240.28 g) compared to IG2 (7.39±96.68g) and CG (28±224.4 g) (p<0.001) No significant difference between IG2 and the CG (p>0.050).
13	Sankaranaray anan et al., (2005) India	RCT with block randomizati on	N=112 IG1=38 IG2=37 BW 1500-2000g GA = > 32 weeks Medically stable CG =37 full term babies weighing 2500 grams or more Massage with baby powder	Massage procedure described by Mathai et al (2001) 5 min, 4 times per day by trained person IG 1: coconut oil IG2 : mineral oil from day 2 of life till discharge Massage by mother (who was trained) till day 31 For how long Day 2 of life till 31	Primary outcome: Weight gain & velocity in gm over the first 31 days of life Secondary outcomes -Length gain in cm -.Head growth - Brazelton Neurobehavioral Assessment Scale (BNBAS) - Incidence of adverse events.	IG1 had significantly more weight gain at 31 days (2396.77 ± 208.94vs 2234.38 ± 247.71 & 2260.94 ± 290.37 p < .05) IG2 had more weight gain velocity (g/kg/day 10.99 ± 2.57; vs 9.02 ± 2.13; 7 8.45± 2.75 (p<0.05) Length gain velocity (cm/week) 0.63 ± 0.12; 0.59 ± 0.16; 0.56 ± 0.16 (p < .05) Other outcomes: not significant NS Adverse events in 6 preterm babies.
14	Smith et al., (2013) USA	RCT, Parallel design	N=37 IG =17 CG=20 GA 29 - 32 weeks BW mean IG = 1615.5± 220.3g mean CG = 1641 ± 311.2g	Massage adapted from (Mclure, 2009) Massage was performed for 20 min 2x/day from study days 1 to 29 performed by 9 licensed massage therapists For how long	- Hear Rate variability for 40 minutes - LF/HF ratio at 4 weeks	HRV improved in IG but not in the CG (p<0.05). Massaged males had a greater improvement in HRV than females (p <0.05) - LF/HF ratio of massage infants was lower in the IG compared to the CG (6.34±0.04 vs 8.04±0.06, p <.05)

			Medically stable.	4 weeks		
15	Teti et al., (2009) USA	RCT Parallel design	N=138 IG=66 CG=72 GA<37 weeks (Mean= 30.12, ± 3.45) African American infants Medically stabile	Massage adapted from Field et al, 1986 as TS + KS provided by mothers and assigned by one interventionist with videos related to the NICU and premature infants. Ten 15-min massage sessions with their babies 2 to 3 times a day. The protocol involved alternate 5-min phases of tactile (first and third phase) and kinaesthetic (second phase) stimulation. <u>For how long</u> 20 weeks	Maternal self-efficacy Maternal sensitivity Bayley scales of Infant development MDI & PDI Weight, Length, HC. Mental Development Index (MDI) scores	IG mothers had higher maternal self-efficacy scores (*M* =36.41±2.63) than CG mothers (*M* =35.21±2.95), p < 0.05. -ELBW IG had a mean MDI score that was almost 10 points higher than that of ELBW controls (97.21 12.31 87.83 13.60 p < >05) No other significant differences
16	Vaivre-Douret et al. (2009) France	RCT Multi-arm Parallel design	N=49 IG1=12 IG2=12 IG3=12 CG =13 GA 31-34 wks. Medically stable	Sensori-Tonico-Motor (STM) Massage with either: IG1= sweet almond oil, IG2= ISIO4 blended oil, IG3=placebo – normal saline protocol was performed by Physical therapist for 15 min, 2 times daily during the periods of wakefulness <u>For how long</u> 10 days (from days 5 or 6 through days 15 or 16	<u>Primary Outcome</u> 1-Weight gain in gm. <u>Secondary Outcomes</u> 2-linear growth, neurological maturation, psychomotor development 3- LOS	IG2 demonstrated enhanced weight gain (+57%, 95%, CI 37–76) compared with CG (p = 0.03). -All IGs had increased linear growth p = 0.003 -IG 2 had increased neurological score p =0.001. -IG2 had increased psychomotor scores p = 0.028 -All IGs groups showed shorter LOS times (mean reduction 15 days, 95% CI 23–50 days hospitalized, (*p* = 0.005).

*IG=intervention group CG= Control group GA=Gestational age BW=Birth weight ?= Data not reported

1. ****MASSAGE THERAPY** is defined by The American Massage Therapy Association (2008) as a profession in which the practitioner applies manual techniques, and may apply adjunctive therapies, with the intention of positively affecting the health and well-being of the client.
2. **MASSAGE** is manual soft tissue manipulation, and includes holding, causing movement, and/or applying pressure to the body. **MANUAL** means by use of hand or body.
3. **THERAPY** is a series of actions aimed at achieving or increasing health and wellness.

2.3.7.2 Critical appraisal of included studies

The rigour of the review was ensured by critically appraising the studies before including them in the review. Ten studies were excluded as they were judged to be of poor quality. Evaluating the quality of primary sources included in the IR (for internal validity) was a complex process. The objectives were to define the sources of potential bias in the included studies through the IR and the potential impact of bias on the summary results. It is for this reason that extra effort was taken to make sure only high quality studies or studies at a low to moderate risk of bias were included (Table 2.4). This prevented the inclusion of studies that could misrepresent the synthesis of the review (Dixon-Woods et al., 2004). A form was agreed upon by reviewers for the quality appraisal (Appendix 12; Data Extraction and Quality Assessment Form) developed after consulting several checklists and quality assessment forms. Various criteria for reporting qualitative studies such as those from COREQ; CONSORT extension for non-pharmacologic trials; Quality Appraisal Criteria for Empirical Papers by Dixon-Woods et al. (2005) and Dixon-Woods et al. (2007); elements from the CASP checklist; Cochrane risk of bias tool for RCTs (Higgins & Green, 2011; Littell et al., 2008); and Criteria for the systematic review of health promotion and public health interventions by Jackson & Waters (2005) were consulted. However, the McInnes and Chambers (2006, 2008) criteria was chosen as it applies to different types of quantitative research and also includes the domain-based assessment for the risk of bias in clinical trials as identified by the Cochrane Handbook (Higgins & Green, 2011; Higgins et al., 2011). According to the Cochrane Handbook for Systematic Reviews of Interventions (2011), a domain-based assessment is recommended (Higgins, Deeks & Altman, 2008) to evaluate the risk of bias for RCTs judging them as either ‘low’, ‘high’ or ‘unclear’.

The summary detailed in Table 2.5 for the Quality Assessment (QA) of the studies (N=16) included 19 items from the quality assessment criteria (McInnes & Chambers, 2008). BA took the lead in the appraisal process and quality assessment of all articles. Methodological QA for each study was documented as a percentage of the total number of categories listed on the quality

assessment form (Appendices 12 and Table 2.5). MJ, HW, and CBJ then independently scrutinized 10% of the included papers to verify that the rigor and process had been correctly applied by BA. For the purpose of this review and in order to assess the methodological quality of each study, items on the Quality Assessment Tool were adopted from McInnes & Chambers (2006, 2008) enabling the quality rating of individual papers. A 'good' study is defined as one with a QA score of more than 70% (low risk of bias). An intermediate study has a grading between 50-70% (moderate risk of bias). A poor study has a grading of less than 50% (high risk of bias).

If qualitative studies had been identified, they would have been critically reviewed based on the information from the CASP checklist to interpret the findings (Appendix 13) and evaluate their rigour (Dixon-Woods et al., 2004).

Validity of the included clinical trials was assessed using well-defined criteria by the Cochrane Collaboration (Higgins & Green, 2011; Littell et al., 2008) to minimize the risk of bias that was incorporated in the tool used.

2.3.7.3 Criteria for risk of bias in the included studies

Since all of the included studies were RCTs, there was a need to assess the validity of the clinical trials according to the following criteria: size of trial group, outcome relevant to the study questions, baseline and internal sensitivity to be able to measure a change following MPM intervention, and fitting data analysis using the appropriate statistical tests and handling of dropouts (White & Schmidt, 2005).

The risk of bias was assessed at the study level. Each item in Table 2.5 provides a description of what was reported in the study and a subjective judgment regarding bias ('Yes' for a low risk of bias, 'No' for a high risk of bias; 'Unclear' partially met). The full 19 items from McInnes & Chambers (2006, 2008) were used in order to assess the methodological quality of each study. However, as seen in Table 2.5, the items 7 - 16 which specifically related to

methodological criteria for risk of bias were used to appraise each RCT as dictated by the Cochrane handbook (Higgins & Green, 2011). The other items 1 - 6 and 17 - 19 were used to evaluate the quality of the papers.

1. *Selection bias* (items 7 and 8): Selection bias is when there are systematic differences between baseline characteristics of the groups that are compared. This process eliminates bias, making all confounders equal in both the experimental and control group arms of the study. Studies in this review were assessed for random sequence generation, such as random number table or computer random number generation as well as allocation sequence concealment, as the person who generates the allocation sequence should not be the person who determines eligibility and entry of patients (Altman & Schulz, 2001). This reduces the possibility of human error in interfering with the allocation of participants to the control or experimental group, or in the randomization and group allocation to prevent larger treatment effects or distortion (Webb & Roe, 2007).

2. *Performance bias* (items 10 and 11): Blinding of personnel/care-providers is important to prevent any human influence to change behaviour or influence the outcome.

3. *Detection bias* (item 9)*:* Blinding of outcome assessors, observers/data collectors and data analysts to prevent unequal balance of prognostic factors and/or change in results. Trials that blind the people who will assess outcomes to the intervention allocation are less likely to be biased than trials that do not (Webb & Roe, 2007).

4. *Attrition bias* (items 13, 14 and 15)*:* Incomplete outcome data/attrition bias fails to include all participants who initially entered in the study in the final results. It refers to systematic differences between comparison groups regarding the loss of participants from the study, and whether or not there had been a proper accounting of participants in the Intention to Treat Analysis.

5. *Reporting bias* (items 12 and 16)*:* This process eliminates selective reporting bias i.e. reporting mainly statistically significant differences between the intervention and control groups known as “within study publication bias” (Chan & Altman, 2005).

The consensus between reviewers was to only include the intermediate and good studies to ensure review rigour, as poor methodological quality might lead to inflated effects through smaller studies (Schünemann et al., 2011). Only 16 studies rated as intermediate or good were included, and the other 10 studies were excluded due to the assessment of their low quality. Table 2.5 presents the research studies ranked in descending order for their quality (QA %).

Table 2.5: Summary of Quality Assessment for all studies meeting inclusion criteria: Sources of risk of bias (n=16 RCTs)

Study reference/ Item	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	**TOTAL YES/ 19**	**Quality rating %**	**TOTAL NO/19**	**TOTAL Unclear /19**
	Clear aims/hypotheses and objectives	Clear description of intervention	Recruitment method given	Sample size/power calculations given	Population demographics given	Explicit inclusion/exclusion criteria	Baseline characteristics statistically equal	Randomization / allocation concealment	Blinding of researchers/data collector	Blinding of Care providers	Groups treated equally aside from intervention	Data recorded and presented in detail	Complete follow-up with drop-outs fully explained	Attrition rate for both control and experimental group	Analysis by intention to treat (N/A for older studies)	Analysis appropriate and details given	Conclusions substantiated by data	Limitations of study discussed	Definition of massage				
2. Ang et al., 2012	Y	Y	Y	Y	Y	Y	P	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	18	97.3	0	1
14. Smith et al., 2013	Y	Y	Y	Y	P	Y	Y	Y	P	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	17	94.7	0	2
1. Aly et al., 2004	Y	Y	Y	Y	Y	Y	P	Y	Y	Y	P	Y	Y	Y	Y	Y	Y	P	Y	16	92.1	0	3
8.Gonzalez et al., 2009	Y	Y	Y	N	Y	Y	Y	P	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	16	76.3	2	1
15.Teti et al., 2009	Y	P	Y	Y	Y	Y	P	Y	P	N	Y	P	Y	Y	Y	Y	Y	Y	P	13	76.3	1	5
10.Kumar et al., 2012	Y	Y	Y	Y	Y	Y	Y	Y	N	N	P	Y	Y	Y	P	Y	Y	P	Y	14	71	2	3
11.Moyer-Mileur et al., 2013	Y	Y	P	Y	Y	Y	Y	N	P	Y	Y	Y	P	Y	N	Y	Y	P	Y	13	68.4	2	4
16.Vaivre-Douret et al., 2009	Y	Y	Y	Y	Y	Y	P	P	N	Y	P	Y	P	P	N	Y	Y	Y	Y	12	65.7	2	5
7. Fucile & Gisel, 2010	Y	Y	Y	Y	Y	Y	P	P	P	Y	Y	Y	P	N	N	Y	Y	P	Y	12	65.7	2	5
6. Fucile et al., 2011	Y	Y	Y	Y	Y	Y	P	P	P	Y	Y	Y	P	N	N	Y	Y	P	Y	12	65.7	2	5
3. Ferber et al., 2002	Y	Y	Y	Y	Y	Y	Y	P	Y	N	Y	Y	P	P	N	Y	Y	P	Y	13	63.1	3	4
4. Ferber et al., 2005	Y	Y	Y	N	P	Y	Y	P	Y	N	Y	Y	Y	P	N	Y	Y	P	Y	12	57.8	3	4
9.Guzzetta et al., 2011	Y	Y	Y	N	N	Y	N	Y	Y	N	P	Y	Y	Y	Y	Y	Y	Y	Y	14	55.2	4	1
12.Saeedi et al., 2011	Y	P	Y	Y	Y	Y	Y	Y	Y	N	P	Y	N	P	N	Y	Y	Y	N	12	50	4	3
13.Sankaranarayanan et al., 2005	Y	P	Y	Y	Y	Y	Y	Y	N	N	Y	Y	P	Y	N	Y	Y	N	P	12	50	4	3
5. Field et al., 2008	Y	Y	Y	Y	Y	Y	Y	N	N	N	Y	Y	P	P	N	Y	Y	P	Y	12	50	4	3
TOTAL (numb. of YES/16)	16	13	15	13	13	16	9	8	7	7	11	15	8	9	6	16	16	7	13				
% of YES	100	81	93	81	81	100	56	50	43	43	68	93	50	56	37	100	100	43	81				

Y: fully met Yes=+1 P: unclear or partially met=+0.5 N: not met = -1 NA: not applicable = 0

The scores of all applicable items are totaled, and the percentage score is derived by dividing the total by the number of applicable items (McInnes & Chambers, 2008). Grade over 19

Studies are graded as good if they scored: >70% **Studies are graded as intermediate if they scored: 50–69%** **Studies are graded as poor if they scored: <50%**

2.3.7.4 Overall quality assessment of the included studies

The review demonstrated that the study quality was variable from good to intermediate (Table 2.4). Six studies out of the 16 were graded as good quality as they scored >70% (studies 1, 2, 8, 10, 14, 15; Aly et al., 2004: Ang et al., 2012; Gonzalez et al., 2009; Kumar et al., 2013; Smith et al., 2013; Teti et al., 2009). Out of this group three studies (studies 1, 2, 14; Aly et al., 2004: Ang et al., 2012; Smith et al., 2013) were graded as > 92%. Ten studies were then rated as having an intermediate quality between 50–69% (studies 3, 4, 5, 6, 7, 9, 11, 12, 13, 16; Ferber et al., 2002; Ferber et al., 2005; Field et al., 2008; Fucile & Gisel, 2010; Fucile et al., 2011; Guzzetta et al., 2011; Moyer-Mileur et al., 2013; Saeedi et al., 2011; Sankaranarayanan et al., 2005; Vaivre-Douret et al., 2009).

2.3.7.4.1 Risk of bias in the included studies

1. *Selection bias* (items 7 and 8): It should be noted that the allocation concealment was unclear or not done in eight of the sixteen included studies. Lack of allocation concealment can potentially exaggerate the treatment effect compared with RCTs with adequate concealment (Higgins & Green, 2011). Two studies did not perform allocation concealment (Field et al., 2008; Moyer-Mileur et al. 2013) and six had unclear concealment (Gonzalez et al. 2009; Vaivre-Douret et al. 2009; Ferber et al. 2002; Ferber et al. 2005; Fucile & Gisele 2010; Fucile et al., 2011) which might affect confidence in the findings (Table 2.5).
2. *Performance bias* (items 10 and 11): Blinding of care providers decreases the risk of differential behaviour by health care providers across groups (Higgins, Deeks, & Altman, Cochrane Handbook, 2008). Blinding was provided for care providers (Item 10) in 7 out of the 16 studies (Aly et al., 2004; Ang et al., 2012; Fucile & Gisel, 2010; Fucile et al., 2011; Moyer-Mileur et al., 2013; Smith et al., 2013; Vaivre-Douret et al., 2009). This reflects the challenges of preventing performance bias in this type of trial. It is worth noting that

blinding of the personnel in most MPM interventions in the NICU is not possible and staff bias can only be minimized by the researchers. This can only be done by having different staff allocated to administering the interventions from those who collect data (Friedberg, Lipsitz, & Natarajan, 2010). Blinding of care providers was not possible in nine studies (Gonzalez et al., 2009; Kumar et al., 2012; Teti et al., 2009; Ferber et al., 2002; Field et al., 2008; Ferber et al., 2005; Guzzetta et al., 2011; Saeedi et al., 2011; Sankaranarayanan et al., 2005). The groups were treated equally aside from the intervention (Item 11) in 11 out of the 16 studies.

3. *Detection bias* (item 9)*:* Blinding of assessors/data collectors which prevents any change in reading the results was performed in only seven studies out of the 16 (Ang et al., 2012; Aly et al. 2004; Gonzalez et al., 2009; Ferber et al., 2002; Ferber et al., 2005; Guzzetta et al., 2011; Saeedi et al., 2011). Blinding of data analysts prevents unequal balance of prognostic factors; it was performed in only two of the studies (Ang et al., 2012; and Gonzalez et al., 2009) out of the 16. However, blinding of data collectors was not done in four studies (Field et al., 2008; Sankaranarayanan et al., 2005; Kumar et al., 2012; Vaivre-Douret et al., 2009), and blinding of data collectors was not clear in five studies (Smith et al., 2013; Teti et al., 2009; Moyer-Mileur et al., 2013; Fucile & Gisel, 2010; Fucile et al., 2011).
4. *Attrition bias* (items 13, 14 and 15)*:* Complete follow-up (Item 13) was performed in eight studies out of the 16. Attrition rates were reported for both experimental and control groups (Item 14) in nine studies out of the 16. The attrition rate was not well explained or not reported in seven studies (Vaivre-Douret et al., 2009; Field et al., 2008; Fucile & Gisele, 2010; Fucile et al., 2011; Ferber et al., 2002; Ferber et al., 2005; Saeedi et al., 2011). The Intention to Treat Analysis (Item 15) was performed in six studies while the Intention to Treat Analysis was not well explained or not done in the remaining ten of the studies out of the 16. (Field et al., 2008; Fucile & Gisele, 2010; Fucile et al., 2011; Moyer-Mileur et al.,

2013; Ferber et al., 2005; Saeedi et al., 2011; Sankaranarayanan et al., 2005 ; Vaivre-Douret et al., 2009; Ferber et al., 2002; Kumar et al., 2012).

5. *Reporting bias* (items 12 and 16)*:* Low risk for reporting bias was observed in all of the 16 included studies; where all the study's pre-specified outcomes were reported.
6. *Other potential sources of bias:* Three studies (Aly et al., 2004; Ang et al., 2012; Smith et al., 2013) were graded as good > 92% with low risk of bias, but there were the following concerns for other possible sources of bias:

- Aly et al. (2004) study: The duration of MPM was not specified.
- Ang et al. (2012) study: The recruitment period was long; between August 2005 and January 2009.
- Smith et al. (2013) study had a small sample size and the inter-observer reliability was not determined.

Three studies (Gonzalez et al., 2009; Kumar et al., 2012; Teti et al., 2009) were border line for intermediate risk of bias (graded as good > 71%). Two of the studies had the following concerns for other possible sources of bias:

- Teti et al. (2009) study had unclear description of the MPM intervention and long recruitment period (Feb 2002 to Dec 2004).
- Gonzalez et al. (2009) study had an unjustified sample size and did not follow developmental outcomes for infants beyond 35 weeks.

Studies that were rated as having an intermediate quality between 50–69% were judged as having other possible sources of biases:

- Moyer-Mileur et al. (2013): Small sample size.
- Ferber et al. (2005): Unjustified sample size and different participant numbers were reported.
- Guzzetta et al. (2011): Long recruitment period (November 2005 to August 2007). Unjustified sample size. Baseline characteristics for CG and IG were not statistically equal.

- Saeedi et al. (2011): Unclear description of the MPM intervention.
- Sankaranarayanan et al. (2005): Unclear description of the MPM intervention. Unclear description of adequate family support. Parents who lived far from the hospital were excluded. The trained person who performed the MPM had unclear qualifications.
- Vaivre-Douret et al. (2009): there were diverse interventions in addition to MPM, and the birth weights differed between the control and experimental groups which was not adjusted for in the analysis.

2.3.8 Data synthesis

Most of the studies included in this review reported statistically significant results favoring the MPM intervention. The similarities and differences as well as patterns and variations between studies were pooled and combined in a descriptive form. The method consists of data display and drawing conclusions (Miles & Huberman, 1994; Whittemore & Knafl, 2005). A synthesis was performed linked to the review questions (Table 2.5) to determine:

1. Participants, MPM provider (by whom the intervention was delivered: mother, nurse, physician, physical therapist (PT), and MPM technique (how massage is defined and delivered in terms of intensity, frequency, and duration; with or without kinaesthetic stimulation, with or without oil)
2. Context: Country and standard care
3. Mechanisms of action behind the effectiveness of MPM
4. Study outcomes

This IR summarized the primary and secondary outcomes of included studies by country, type of massage, and provider (Table 2.5). The MOA behind the effectiveness or ineffectiveness of the MPM were highlighted. Only one study described standard care, while

none revealed the impact of the context of treatment on patient outcomes. All of the studies were heterogeneous in terms of intervention and outcome measures.

Table 2.6: Included Studies by Country, Type and Provider of Massage, Outcomes and the suggested Underlying Mechanism of Action (n =16)

Study ID	**Massage technique**				**Massage provider**						
Author/Yr/ Country	**Field 1986 T/K***	**Mathai 2001 T/K**	**Vimala 2000 T/K**	**Vaivre-Douret 1997, 2003 T/K**	**Physio-therapist**	**Nurse**	**Physician**	**Mother /parent**	**Standard care**	**Outcomes**	**Underlying Mechanism of Action**
1. *Aly et al., 2004 (Egypt)*	✓						✓		Standard care was not adequately described	Serum type I collagen C-terminal propeptide (PICP) and urinary pyridinoline crosslinks of collagen (Pyd)	"Lack of stimulation due to maternal deprivation can decrease growth hormone levels and impair metabolic efficiency." p. 308.
2. *Ang et al., 2012 (USA)*	✓					✓			Standard care was not adequately described	Immunologic evaluations Length of Stay (LOS) Reports of any side effects	"Possible explanation of weight gain in infants who received MT includes increase in parasympathetic (vagal) activity during MT, which stimulates the release of food absorption hormones such as insulin and gastrin" p. 1557
3. *Ferber et al., 2002 (Israel)*	✓ TS** only					✓		✓	Standard care was not adequately described	Weight gain	"More efficient use of calories was detected among treatment subjects" expressed as weight gain. p. 42.
4. *Ferber et al., 2005 (Israel)*	✓TS only					✓		✓	Standard care was not adequately described	Maternal Infant Interaction MII	"Massage therapy has long-term effects on …the mother's behaviour, and the degree of reciprocity between mother and child" during an important "sensitive" period. This "may lead to improved infant self-regulation and social responsiveness regardless of the identity of the massaging figure". p.79.
5. *Field et al., 2008 (USA)*	✓				✓				Standard care was not adequately described	Serum insulin and serum IGF-1	"IGF-1 plays a role in promoting growth by stimulating cell growth and multiplication, and inhibiting apoptosis. Massage therapy increase calmer states in neonates. This is likely the result of a parasympathetic

											response elicited by the stimulation of pressure receptors that is, in turn, associated with both decreases in cortisol levels and increases in vagal activity. Tactile stimulation and increased vagal activity have also been associated with the release of food absorption hormones which could contribute to more efficient food absorption". p. 2.
6. *Fucile et al., 2011 (USA)*	✓				✓				Standard care was not adequately described	Weight gain Motor development	"Oral feeding is a complex multisystem process that involves both the oral and other systems, including cardiorespiratory, gastrointestinal, and neurological. It is conceivable, therefore, that sensorimotor input targeting non-oral systems, such as trunk and limbs, may have distributed effects that go beyond the target system and improve oral feeding performance." p.829.
7. *Fucile & Gisel, 2010 (USA)*	✓				✓				Standard care was not adequately described	Oral feeding performance LOS	" oral (O+O), a tactile/kinaesthetic (T/K+T/K), and a combined (O+T/K) interventions may increase gastric motility gastric emptying and release of hormones promoting food absorption, such as gastrin and insulin, via activation of vagal tone". p.364.
8. *Gonzalez et al., 2009 (Mexico)*			✓					✓	Standard care was adequately described***	Weight gain LOS Reports of any side effects	"Stimulation of baroreceptors increases vagal response with subsequent stimulation of gastric motility and release of hormones that increase absorption of nutrients"p.250.
9. *Guzzetta et al., 2011 (Italy)*	✓				✓				Standard care was not adequately described	EEG changes	"Massage therapy favours a process of maturation of brain electrical activity similar to that observed (in utero) in term infants, probably through an attenuation of the discrepancies between the extra- and intra-uterine environments". p.50.
10. *Kumar et al., 2012 (India)*	✓ TS only with							✓	Standard care was not adequately described	Weight gain Length and head circumference Serum triglyceride	"The probable mechanism for lesser weight loss in oil massage group could be lesser insensible water loss through the skin due to blockage of pores sweat glands. Also, early oil application probably causes better

	oil										temperature regulation and less calorie expenditure due to cold stress. This could contribute to lesser weight loss in first 7 d and better weight gain in first month". p.4.
11. *Moyer-Mileur et al., 2013 (USA)*			✓		✓				Standard care was not adequately described	Weight gain Body fat deposition in males	"Improved autonomic nervous system maturation and parasympathetic activity in massage infants with a greater response noted in male compared with female preterm infants. The data may suggest a mechanism by which twice-daily massage improves growth quality by decreasing stress-driven fat deposition in male preterm infants". p.4.
12. *Saeedi et al., 2011 (Iran)*		✓ TS only with and without oil (2 arms)				✓			Standard care was not adequately described	Weight gain	"Coconut oil is composed entirely of medium-chain acids (MCFAs) which provide a source of highly efficient cellular food. When it is applied topically, the cells absorb the MCFAs and convert them into energy. Because MCFAs are used to produce energy rather than packed away into fat cells, coconut oil can be used in weight gain". p.666.
13. *Sankaranarayanan et al., 2005 (India)*		✓ with and without oil (3 arms)				✓		✓	Standard care was not adequately described	Weight gain Length and head circumference Brazelton Neonatal Behavioural Assessment Scale (1984) (BNBAS) Reports of any side effects	"Application of a barrier such as oil or emollient prevents insensible water loss from the skin and helps to maintain temperature. Better thermoregulation may promote better weight gain. …Better somatic growth after massage with oil application. The skin of a preterm baby allows significant absorption of fat, as it is thinner and more vascular. This may result in greater caloric intake and a better weight gain". p. 882 and 883.
14. *Smith et al., 2013 (USA)*			✓		✓				Standard care was not adequately described	Heart rate variability	"Increased sympathetic activity during exposure to stressors and increased parasympathetic activity during sleep when restoration occurs. Male infants appeared more sensitive to caregiving as a stressor with increased LF:HF ratio, suggesting sympathetic activation which may be related to higher testosterone levels". p.528.

15. Teti et al., 2009 (USA)	✓					✓		✓	Standard care was not adequately described	Maternal self-efficacy Bayley Mental Development Index (MDI)	"The program of *parentally administered* massage to promote parents' awareness of infant bodily and social cues and parents' sensitivity and confidence in handling their infants (Evans, 1990)" p.148.
16. Vaivre-Douret et al., 2009 (France)				✓ with and without oil (3 arms)	✓				Standard care was not adequately described	Weight gain Length and head circumference Motor development LOS	"Massage lead to increase in vagal activity promoting the secretion of hormones involved in food absorption, in particular insulin (Field et al, 1987; Uvnäs-Moberg et al., 1987; Acolet et al. 1993; Diego et al, 2005)". p.102

***T/K= Tactile and kinaesthetic stimulation **TS Tactile stimulation**

******* Standard care was adequately described as: -Daily bathing and orogastric feeding. -Vital signs every 4 hours. -Diaper changes by nursery personnel every 4 hours, or when necessary including change in clothing. -Human contact was provided an average of 15 times in 24 hours, including nursery personnel and parents. Mothers had four set visit times (9:00, 12:00, 15:00, and 18:00 hours) staying on average for one hour to participate in feeding and changing diapers for their children; fathers were allowed two visits per day (morning and afternoon).

2.3.8.1 Participants, massage provider, and massage technique

The sample size in the included studies ranged between N=20 (Guzzetta et al., 2011) to N=138 (Teti et al., 2009). The 16 studies included 1,031 infants in total. All of the studies included medically stable infants whose weight ranged from 600-2200 grams and whose gestational age ranged between 26 and 37 weeks. One study (Guzzetta et al., 2011) specified that the infants should not present abnormalities on ultrasound for inclusion in the study sample. Detailed information on the participants' characteristics is given in Table 2.4.

In ten studies MPM was delivered by staff- either a nurse, physician, or physical therapist (Aly et al., 2004; Ang et al., 2012; Field et al., 2008; Fucile & Gisel, 2010; Fucile et al., 2011; Guzzetta et al., 2011; Moyer-Mileur et al., 2013; Saeedi et al., 2011; Smith et al., 2013; Vaivre-Douret et al., 2009) (Table 2.5); in two studies MPM was delivered by a parent (Gonzalez et al., 2009; Kumar et al., 2012); and in four studies MPM was delivered in two arms by either parent or staff (Ferber et al., 2002; Ferber et al., 2005; Sankaranarayanan et al., 2005; Teti et al., 2009). Ten studies (Aly et al., 2004; Ang et al., 2012; Ferber et al., 2002; Ferber et al., 2005; Field et al., 2008; Fucile & Gisel, 2010; Fucile et al., 2011; Guzzetta et al., 2011; Kumar et al., 2012; Teti et al., 2009) used the MPM therapy described by Field (1986); seven with Kinaesthetic Stimulation and three (Ferber et al., 2002; Ferber et al., 2005; Kumar et al., 2012) without Kinaesthetic Stimulation. One used oil (Kumar et al., 2012); two used the MPM therapy described by Mathai (Sankaranarayanan et al., 2005; Saeedi et al., 2011); three used the Mclure method (Gonzalez et al., 2009; Moyer-Mileur et al., 2013; Smith et al., 2013); and one used the Vaivre-Douret (Vaivre-Douret et al., 2009) method. The duration of MPM differed from one study to another and varied from five days (Field et al., 2008) to 20 weeks (Teti et al., 2009) normally administered two to three times per day. In three studies MPM was administered with oil four times per day (Sankaranarayanan et al., 2005; Saeedi et al., 2011; Kumar et al., 2012). The data increased the clinical heterogeneity of the intervention effects among the studies.

2.3.8.2 Country and standard care

Studies were conducted on three continents: eight in North America, six in Asia (four in the Middle-East and two in India), and two in Europe. In addition to the diversity of locations, there was a wide range of MPM techniques used, however the contextual issues of the intervention in comparison to standard care were not well described in most of the studies. Fifteen out of the sixteen studies did not adequately describe the standard care given. Only one study by Gonzalez et al. (2009) in Mexico described the standard nursing care. The information about standard care is valuable in order to give insight into the context and clarify some of the factors to be evaluated in the NICU setting for future implementation of MPM such as daily bathing, orogastric feeding, monitoring of vital signs, and diaper changes by nursery personnel.

2.3.8.3 Mechanism of action

The MOA behind why MPM is of benefit has not been fully understood. Therefore, this needs to be handled cautiously; not to take quick conclusions since the strength of evidence is undefined as most were speculative. This section as a whole demonstrates how conceptions of the MOA of MPM have evolved as several investigators have looked beyond the assumptions of psychosocial and behavioural conception of the MPM model such as: maternal self-efficacy (Teti et al., 2009) and mother-infant interaction (MII) (Ferber et al., 2005) for more biochemical multidimensional conceptions of massage. For instance, Guzzetta et al. (2011) have postulated that infant MPM may help mature the electrical brain activity and the central nervous system by normalizing its function to equal that of a term infant. Another study suggested that MPM might improve the growth quality by decreasing stress-driven fat deposits particularly in male preterm infants (Moyer-Mileur et al., 2013). In the same vein, Smith et al., (2013) proposed that MPM has a stress response attenuating effect by increasing parasympathetic activity. This tempering of the stress response has been particularly seen in males and is suggested to have protective effects (Smith et al., 2013).

Several studies explained that infant MPM moderates cortisol production and promotes glucocorticoid receptors in the hippocampus and increases vagal activity which aids the secretion of gastrointestinal hormones important for food absorption, particularly insulin and gastrin; this leads to an increased secretion of growth hormones, neuro-endocrine substances and a more efficient use of calories necessary for growth (Aly et al., 2004; Ang et al., 2012; Ferber et al., 2002; Field et al., 2008; Fucile et al., 2011; Gonzalez et al., 2009; Vaivre-Douret et al., 2009). Field et al. (2008) proposed that MPM therapy may lead to increased weight gain through two mechanisms: increased vagal activity and gastric motility increasing insulin levels leading to increased food absorption and therefore increased weight gain; and the release of IGF-1 directly leading to greater weight gain. On the other hand, it has been postulated that MPM enhances the development of oral feeding performance measured by using the Test of Infant Motor performance TIMP (Fucile & Gisel, 2010); and that oil MPM when absorbed by the skin helps to maintain the temperature and provides a source of food and energy (Sankaranarayanan et al., 2005; Saeedi et al., 2011; Kumar et al., 2012). According to Kumar et al. (2012), infants who received oil MPM had less weight loss in the first week, probably due to undetectable water loss through the skin due to blockage of pores and sweat glands. However, the exact MOAs have not yet been tested or confirmed, rather they remain as hypotheses and further research is required to ascertain exact MOA and whether MPM can be the treatment of choice for preterm/LBW infants.

2.3.8.4 Study outcomes

Outcomes varied with some studies focusing on physiological outcomes and others on behavioural outcomes (Table 2.5). The primary outcomes measured were: weight gain in eight studies (Ferber et al., 2002; Field et al., 2008; Fucile et al., 2011; Gonzalez et al., 2009; Kumar et al, 2012; Saeedi et al., 2011; Sankaranarayanan et al., 2005; Vaivre-Douret et al., 2009); length of stay in four studies (Ang et al., 2012; Fucile & Gisel, 2010; Gonzalez et al., 2009; Vaivre-Douret et al., 2009); maternal outcomes in two studies (Ferber et al., 2005; Teti

et al., 2009); MII in one study (Ferber et al., 2005); infant development and length and head circumference in four studies (Kumar et al., 2012; Moyer-Mileur et al., 2013; Sankaranarayanan et al., 2005; Vaivre-Douret et al., 2009); triceps skinfold thickness in one study (Moyer-Mileur et al., 2013); motor development in two studies (Fucile et al., 2011; Vaivre-Douret et al., 2009); infant behavioural responses in one study (Sankaranarayanan et al., 2005); physiological outcomes (vagal activity, gastric motility, brain maturation, bone formation, insulin, body fat deposition and immunologic markers and heart rate variability) in six studies (Aly et al., 2004; Ang et al., 2012; Field et al., 2008; Guzzetta et al., 2011; Moyer-Mileur et al., 2013; Smith et al., 2013) ; and negative outcomes in three studies (Ang et al., 2012; Gonzalez et al., 2009; Sankaranarayanan et al., 2005).

The results demonstrate that MPM is a safe practice administered most often by HCPs. Most of the studies reported short term benefits that included physiological and developmental benefits for the infant as well as maternal self-efficacy and MII. None of the studies assessed breast feeding outcomes or the facilitators and barriers in relation to the context when implementing MPM techniques on preterm and/or LBW infants in NICU. The following section will report the findings by study outcome broken down into the seven major areas affected by MPM.

2.3.8.4.1 Massage and weight gain, length and head circumference

Seven out of eight studies that assessed weight gain reported statistically significant larger weight gain (mean daily weight gain (g/d) ranging from 16.8 (4.8) to 476.7(47.9) especially the four studies that combined MPM with oil application (Kumar et al., 2012, Saeedi et al., 2011, Sankaranarayanan et al, 2005, Vaivre-Douret et al., 2009). One study reported no difference in weight (Moyer-Mileur et al., 2013). One study did not report any values for weight (Teti et al., 2009) despite efforts to contact authors for missing information. Weight was measured by either weight at discharge, total mean weight gain or daily mean weight gain. It was reported in two studies that when MPM was provided for at least three

days, a significant effect in weight gain was sustained throughout the remainder of the study (Ferber et al., 2002; Gonzalez et al., 2009).

Given the different reporting measures of the weight outcome in the included RCTs, this raises important caveats when we attempt to interpret the results and decide how generalizable they are. However, a meta-analysis could not be performed for these studies because of heterogeneity, missing data, high or unclear risk of bias and the reporting of trials were not standardized.

Length and head circumference were measured in four studies (Sankaranarayanan et al., 2005; Kumar et al., 2012; Vaivre-Douret et al., 2009; Moyer-Mileur et al., 2013) and found no significant differences except for length gain in Sankaranarayanan et al. (2005). One study also measured triceps skinfold thickness (Moyer-Mileur et al., 2013) which reported greater skinfold thickness increase in massaged female infants than control infants ($P < .05$). Many of the trials were short term, some only lasting a few weeks. This could also be a significant limitation in the available data.

2.3.8.4.2 Massage and length of stay (LOS) and breastfeeding

Results of the RCTs are conflicting, and many were underpowered to detect a difference between MPM treatment and the control group. Four studies assessed LOS with only two providing positive results related to the efficacy of MPM in reducing days spent in the NICU (Gonzalez et al., 2009; Vaivre-Douret et al., 2009) and one study (Fucile et al., 2011) did not report a specific protocol for infant discharge from the NICU in the study. These three studies provided the MPM for ten days or more which has the potential to suggest that the longer the MPM was employed the shorter the LOS. As a result, confusion exists as to the role of MPM in decreasing LOS, with varied MPM application guidelines making varying recommendations. The modest effects of MPM on LOS in the two studies mentioned above (mean reduction 4 and 15 days respectively) could be due to the fact that several infant and caregiver variables may influence the health outcomes of infants in the

NICU. Moreover, the LOS in the NICU is not an objective measure. It can differ from one study to another as it depends on the hospital and NICU discharge policy as well as other variables related to the infant and caregivers. In addition, what could be effective and tolerated for a 24-week infant may be very different than what is effective for a 34-week infant, yet this issue was not mentioned in most of the studies.

Again, since a meta-analysis could not be performed for these studies, missing data, high or unclear risk of bias and the reporting of trials was not standardized, for example: Field et al., 2008; Vaivre-Douret et al., 2009 (Appendix 17; Eligible studies for meta-analysis). Furthermore, no studies were found that looked at the effects of MPM relative to breastfeeding.

2.3.8.4.3 Massage and maternal outcomes

Two studies assessed the benefits of mothers' administering MPM on maternal outcomes (Ferber et al., 2005; Teti et al., 2009). Ferber et al. (2005) noted that mothers who massaged their infants demonstrated, on a Coding Interactive Behaviour Manual (CIB: Feldman, 1998), better mother-infant interactive behaviours at 3 months, manifested more reciprocal behaviours and were less intrusive than those who did not. The CIB global rating system of parent–child interaction has been validated in studies of healthy and at-risk dyads and has shown sensitivity to infant age and cultural setting. Equally, Teti et al. (2009) found that mothers who massaged their infants had higher maternal self-efficacy scores than those who did not. The Maternal Self-Efficacy Scale (MSES) (Teti & Gelfand, 1991), has demonstrated internal reliability and construct validity as a task-specific measure inquiring about perceptions of competence in such tasks as soothing, feeding, diapering, and bathing, understanding what the infant wants and enjoys, communicating with and getting the infant's attention, and keeping the infant occupied. Since clinical heterogeneity such as performance bias has been observed across many of the studies, the findings relating to maternal outcomes

should be examined with caution. It is also important to note that fathers were not included in any of the studies as providers of MPM.

2.3.8.4.4 Massage and infant development

Four studies assessed infant development, with one study using the Bayley scales of infant development (BSID) (Teti et al., 2009) at 3 to 4 months' corrected age. The Bayley Scales of Infant Development-Version II (BSID-II; Bayley, 1993) yields a Mental Development Index (MDI) and Psychomotor Developmental Index (PDI) score. The BSID-II, which is standardized, has well-established psychometrics (Bayley, 1993). Another one used the Test for Infant Motor Performance (TIMP) scale (Fucile & Gisel, 2010), one measured feeding performance (Fucile et al., 2011) and one measured psychomotor development (Vaivre-Douret et al., 2009). Many of these studies have the limitation that they used measures to assess infant development by behaviour observations not typically used for clinical diagnoses. However, they are reliable measures that could be used for universal screening to identify infant development. Mental development scores on the BSID were higher in Teti's study, but not motor scores, while the study that used the TIMP noted higher scores for massaged infants (Fucile & Gisel, 2010) and another study noted improved time to attainment of independent oral feeding performance for infants who received combined oral stimulation and T/K massage over the control group (Fucile et al., 2011). The study by Vaivre-Douret et al. (2009) noted better neurologic and motor scores for infants massaged over 10 days with blended oil.

One study measured the time to attainment of oral feeding (Fucile et al., 2011) and found significant improvement for the massaged infants. One study assessed caloric intake and one assessed feeding volume as measured by calories per day (Ferber et al., 2002) with significant increase in weight. Caloric intake was not different between the control and massaged group suggesting that vagal stimulation may increase gastric motility and promote growth in preterm/LBW infants without an increased intake of calories.

2.3.8.4.5 Massage and infant behavioural responses

One study assessed the effects of MPM on the behavioural state of infants using the Brazelton Neonatal Behavioural Assessment Scale (BNBAS) (Sankaranarayanan et al., 2005). The study found no statistically significant difference in the neurobehavioural assessment between all three subgroups in full-term babies as well as in preterm/LBW infants, which is similar to the findings by Wang et al. (2013). However, Smith (2013) postulates that premature infants who received MPM therapy had increased glucocorticoid receptors in the hippocampus which reduces stress and allows better self-regulation.

2.3.8.4.6 Massage and physiologic outcomes

Five studies assessed physiologic parameters**.** One of these assessed bone formation (Aly et al., 2004), one assessed immunologic markers (Ang et al., 2012), one assessed brain maturity using electroencephalogram (Guzzetta et al., 2011), one assessed body fat (Moyer-Mileur et al., 2013), and one assessed heart rate variability (Smith et al., 2013) with significant improvements in vagal activity, tone and heart rate consistency. All studies reported improved outcomes for all measures. MPM with kinaesthetic stimulation is proposed to stimulate bone formation and ameliorate bone resorption, which is especially critical for preterm/LBW infants whose bone mineralization is low despite dietary supplementation (Aly et al., 2004).

MPM has been noted to increase vagal activity significantly during the therapy as well as serum insulin and IGF 1 which in turn stimulate gastric motility and weight gain (Field et al., 2008). However, Field et al. (2008) did not specify the number of infants in each group.

2.3.8.4.7 Massage and negative outcomes

Only three studies Ang et al. (2012), Gonzalez et al. (2009) and Sankaranarayanan et al. (2005) considered secondary effects of MPM, though for two of them, no adverse events

were reported. Only Sankaranayanan et al. (2005) noted a mild rash in six preterm infants, which were divided equally between the control and the intervention group and did not require the discontinuation of application. Field et al. (2004) states that if massage is performed incorrectly, or is not in line with the infant's behavioural state, it can be over-stimulating resulting in infant stress. Despite this information, the above studies did not specify how to deal with adverse effects when they happen during the intervention, and/or how and when the procedure could be resumed.

2.3.9 Discussion

This extensive review of the literature included 16 RCTs focusing particularly on the short term physiological and psychological effects of MPM therapy on the infant and the mother performed in NICU. This answered the first two IR questions 1 and 2 relating to the evidence of the effects of infant MPM on preterm and/or LBW infants and enabled further clarification on the hypothesized underlying MOAs behind the effectiveness of MPM. Some studies postulated that the stimulation of pressure receptors provoke the effects of MPM on enhanced vagal activity, gastric motility and weight gain though not fully tested. For example, in Field et al. (2011) MPM therapy was hypothesized to increase weight gain through two mechanisms (1) increased vagal activity and gastric motility leading to increased food absorption and increased weight gain; and (2) release of IGF-1 directly leading to greater weight gain.

Based on the synthesis of this review, MPM reduced stress and improved physical and neurodevelopmental outcomes in stable infants. This included faster weight gain, infant self-regulation and lower stress as well as promoting development, MII, improving maternal self-efficacy and decreasing LOS. However, in more than half of these studies limitations were noted such as small sample size, selection, detection, performance and attrition biases as discussed in section 2.3.7.4.1.

The problems of clinical heterogeneity including different types of treatment protocol, frequency and duration of MPM interventions need to be further addressed despite the positive findings from the administration of MPM therapy in hospitalized stable infants. Care-providers, outcomes measured and setting were also noted to be variable among studies. The studies in this review had methodological concerns and several did not provide adequate detail to assess their external validity i.e. applicability elsewhere. Therefore, the results were still inconclusive. None of the studies evaluated contextual issues, and therefore further contextual studies are very much needed. It was quite helpful when new articles became available and could be identified by e-mail awareness alerts from journals and RSS feeds from databases (Moher, Liberati, Tetzlaff, & Altman, 2009) (Appendix 7). This allowed any work published after the structured reviews were conducted to be captured and aid in the discussion chapter.

Since undertaking the review in 2012, several new reviews have been reported in the literature that have helped to support the perspective of this IR (Smith et al., 2013; Wang et al., 2013; Badr, Abdallah, Kahale, 2015; Pepino & Mezzacappa, 2015; Juneau, Aita & Héon, 2015; Álvarez, Fernández, Gómez-Salgado, Rodríguez-González, Rosón & Lapeña, 2017). Similar to the results in the IR review, these new studies further support the diversity in protocols and outcome measurements. This may further suggest that HCPs, in general especially in Europe, are still hesitant to apply this technique despite the growing number of studies in the last few decades. Their findings echo the results reported here regarding the beneficial effects of MPM therapy on hospitalized infants, specifically faster weight gain, shorter hospital stay, better neurodevelopment, physiological stability and better infant behavioural state. They have also suggested that MPM improves circulation and functioning of the digestive system, enhances the immune system, reduces levels of cortisol in plasma, improves sensory awareness, decreases the heart rate, increases vagal activity promoting overall infant development.

However, still no studies were found that looked at the effects of MPM on breastfeeding RQ 1d. In this IR, MPM was performed most often by HCPs. Only six studies added mothers as assisting in MPM, with similar results by both mothers and HCPs. Due to the extended stay in the NICU, preterm/LBW infants are exposed to varying handling and touch stimuli, which are often painful and stressful. Several more recent studies have made consistent observations on the adverse effects of such handling procedures, including hypoxia, bradycardia, sleep disruption, increased intracranial pressure and behavioral agitation (Abdallah et al., 2013; Roofthooft, Simons, Anand, Tibboel, & van Dijk, 2014). Other studies assessed the relationship between MPM and pain responses in preterm infants; Diego et al. (2009) noted that preterm infants who received 15-minutes of MPM therapy prior to the removal of surgical tape exhibited less increase in heart rate than infants who did not receive MPM therapy and thus experienced lower heart rates following the surgical tape removal. These results might be plausible and reflect similar results of a quasi-experiment study conducted by this researcher. The study reported short term significantly lower scores on the Premature Infant Pain Profile (PIPP) for infants who were massaged after a heel-stick compared to the PIPP before the massage in addition to lower PIPP scores at discharge compared to the control group (Abdallah et al., 2013). The significant effect of MPM in reducing pain responses is supported by the gate control theory which postulates that MPM may be effective in "closing the gate" or inhibiting the transmission of noxious stimuli through the process of stimulating large nerve fibers that have been shown to alter pain perception (Mendell, 2014).

None of the individual studies in the IR reported adverse events on the infant as a result of the MPM therapy; with the exception of the study by Sankaranarayanan et al. (2005) that reported a mild rash on six preterm infants, divided equally between the control and the intervention group and not requiring the discontinuation of application. The finding that MPM is a 'safe practice' for clinically stable preterm infants was also reported by the two

reviews of Wang et al. (2013) and Pepino and Mezzacappa (2015). Adding such detail as adverse events would improve the reliability of future studies (Pepino & Mezzacappa, 2015).

A particular issue noted from the IR is how the data have been affected by contextual factors such as the routine care provided which would suggest different treatment effects in the intervention groups. In addition, there are methodological variations in performing the infant MPM in different studies which result in possible variation in the outcome mainly; who delivered the intervention, and the MPM technique, how MPM was delivered, and whether it was with or without kinaesthetic stimulation or with or without oil. In addition, blinding of assessors, i.e. researchers and data collectors, as a risk of bias in the assessment of the MPM outcome was not clear or not performed in some included studies which may lead to changes in outcome conclusions. In other studies missing outcome data due to drop-out during the study raises the possibility that the observed effect estimate is biased (Higgins & Green, 2011).

Although this IR suggests that the administration of MPM may exert beneficial effects in enhancing the outcomes of preterm/LBW infants, this review did not answer the third question pertaining to the facilitators and barriers in relation to context when implementing MPM on infants in the NICU. Gaps in knowledge and methodological flaws were identified in the existing studies. MPM consists of a number of independent and inter-dependent components such as: multiple contributors for delivery (performed by professionals, nurses, or mothers), a range of outcomes, diverse study populations (infant condition and gestational age), level of massage provider expertise (safety issues), and NICU setting characteristics such as volume and context (social, political and geographical). Little attention has been paid to study the factors of the implementation and process outcomes that can affect the success of a complex intervention such as infant MPM (Anderson, 2008; Moher et al., 2009; Edwards & Barker, 2014; May, Johnson, & Finch, 2016). To date, studies of MPM have been carried out in resource rich countries more than resource poor countries (Mainous, 2002; Ferber et al., 2002; Ferber et al., 2005; Field et al., 2008; McGrath, 2009; Mendes & Procianoy, 2008;

Procianoy, Mendes, & Silveira, 2010; Field et al., 2010b; Diego, Field, & Hernandez-Reif, 2014); which questions the applicability of this intervention across other contexts and cultures.

The context of the one study by Gonzalez et al. (2009) where the intervention took place is a very important factor to consider and extract. It is affected by staff number and preparedness, infrastructure, resources available, reward system, unit ethos, characteristics of the target population, and organizational flexibility (Moher et al., 2009). According to Jackson and Waters (2005), the context acts as an effect modifier. Usually the latter information is better drawn from qualitative studies or a mixed methods approach (Hawe et al., 2004). Therefore, thoroughly explaining the context in which the intervention took place is illuminating to the researcher prior to pilot testing in real time.

Previous systematic reviews have mainly examined the effect of MPM on the infant's growth and development, but not on the perceptions, attitudes of HCPs and parents, or cultural, contextual and organizational factors that might facilitate or impede its implementation. Furthermore, there were no qualitative studies available that met the IR inclusion criteria on the subject; neither in Lebanon, nor worldwide. It is therefore unclear which specific contextual issues may inform the applicability of MPM in the NICU environment. There is minimal insight on culturally sensitive interventions that are likely to be accepted into practice. The lack of the fathers' involvement in MPM observed in the IR raises an additional question and this dynamic should be further explored. Future studies need to provide insight into all the dynamics of the impediments that may halt successful implementation of MPM in the NICU (Hawe et al., 2004; Livingston et al., 2009).

The value of this IR is that it included studies from 2000 to 2012 using an extensive search strategy and a reproducible methodology. The rigour of the review was ensured by the application of inclusion criteria, validity assessment and data extraction that were carried out independently using the same rigour checks in coordination with the supervisory team as discussed for other parts of this review.

No qualitative studies were identified that fit the inclusion criteria although experts in the field were contacted (Drs. Renée Flacking, Tiffany Field, Rosa Maria Mendizabal, and Cherry Bond). This review was also limited to the English language, which may have introduced a language bias. Six studies were not included since they were not published in English (2 Iranian, 2 Chinese, 1 German, and 1 Portuguese). Publication date restriction and publication bias were other limitations of this review. Only original articles published in peer reviewed journals were included. A wider search for reports or discussion papers was not carried out. The inclusion of only published studies may overestimate the intervention effect (Song et al., 2000; Ahmed, Sutton, & Riley, 2012). To note, this review still did not answer question 3 about the contextual facilitators and/or barriers to implementing MPM in the NICU, parent-infant interaction and breast feeding outcomes.

2.4 Overall Conclusion

These two reviews have provided information about the effectiveness of MPM as an alternative method of tactile stimulation that can improve the infants' growth and development as well as promoting MII to overcome the negative consequences of hospitalization. However, the intervention in the majority of studies was performed mostly by HCPs with short term follow up, and limited mainly to the first year of life. The majority of the included studies were RCTs that reported a modest effect size with a number of limitations and moderate risk of bias. Therefore, results may still be inconclusive and thus practice might not change. However, considering that preterm/LBW infants are a vulnerable population, any small effect size should be taken into consideration.

There were no studies that examine the issues of implementing MPM in the NICU setting. The facilitators or barriers of MPM application from the perspective of HCPs and parents taking into consideration the cultural and contextual factors are crucial. Most of the literature on infant massage in the last 40 years, as a developmentally supportive strategy to improve infant behavioural and neurologic outcomes, is mainly derived from a quantitative

approach where MPM is primarily performed by health care providers. The evidence from this review suggests there is a need to explore the views of HCPs and parents on the practice of MPM in the NICU and providing insight into the subsequent design of an intervention study that is culturally sensitive, appropriate, and acceptable in practice. In doing so a better understanding of the barriers and facilitators of MPM application in the NICU from the parents' and HCPs' perspectives will be achieved. This, in turn, can create a clearer picture to assist in the design of future MPM implementation strategies for researchers, decision makers and program planners.

In Lebanon, MPM is not applied in NICUs; partly because it is not well-known and HCPs rely mostly on medical interventions for the care of infants. In addition, to the authors' knowledge, no studies have explored the NICU context. Therefore exploring the factors that might impact the implementation of MPM in the Lebanese NICU setting as suggested by the modelling phase of the MRC framework (Anderson, 2008) will be discussed later on. The aim of this qualitative study will be to explore the cultural, organizational and contextual processes within a Lebanese NICU environment that could act as facilitators and/or barriers for future implementation of MPM. The methodology used to seek this in-depth understanding will be described in the following chapter.

CHAPTER 3 : METHODOLOGY AND METHODS

3.1 Introduction

The reviews presented in chapter two provided information about the effectiveness of MPM as a developmentally supportive intervention that can improve an infants' growth and development as well as promoting the mother-infant interaction. However, in the majority of studies, the MPM intervention was performed by HCPs with a short term follow up which was limited mainly to the first year of life. No qualitative studies meeting the integrative review inclusion criteria were identified. This left a gap in knowledge regarding contextual issues that may facilitate or impede the implementation of massage in the NICU. These contextual issues are important to inform the design and implementation of clinical trials in the field of massage. The overall lack of evidence has justified conducting this qualitative study, seeking an in-depth understanding of the parents' and HCPs' perceptions and attitudes towards massage and the cultural, contextual and organizational factors that might affect the implementation of MPM in the Lebanese NICU environment. An exploratory, qualitative study informed by ethnography philosophically underpinned by social constructionism was employed. Data were generated through focus group interviews with parents and HCPs.

3.2 Research Questions

1. What are the parents' perceptions and attitudes towards massage as a potential culturally acceptable form of intervention provided by them in the NICU to improve the outcome of their stable preterm infants?
2. What are the perceptions and attitudes of HCPs concerning massage as a potential culturally acceptable intervention provided by parents in the NICU for stable preterm infants?

3. What are the cultural, contextual and organisational processes that might hinder or facilitate the application of infant massage in the NICU from the HCPs' and parents' points of view?
4. What are the similarities and differences between HCPs' and parents' perceptions and attitudes regarding massage application in the NICU with respect to RQ 1, 2 and 3?
5. What is the interplay between the cultural and contextual factors that might influence future implementation processes of infant massage in a Lebanese context?

3.3 Paradigms and Philosophical Assumptions

3.3.1 Ontological and epistemological approach used

The ontological approach adopted in this qualitative study is based on idealism as defined by Ritchie, Lewis, Nicholls, and Ormston (2014) which asserts that "No external reality exists independent of our beliefs and understandings" (p. 5, 2014). According to Ritchie et al. (2014), reality is socially constructed through the human mind and shared meanings and no reality exists independently of this. Shaw (1999) offers a nuance to this perspective on idealism by indicating that reality constructed and shared by people is context bound.

Epistemology is concerned with how knowledge is created and the relationship and interaction between the researcher and the informants that influence the study findings (Ritchie et al., 2014). Richie et al. (2014) and Blaikie (2007) described two processes for knowledge creation: the inductive process, which involves using evidence to draw conclusions, and the deductive process that uses evidence in support of a conclusion. However, they argue that we cannot separate the inductive and deductive approaches as they are both used to learn about the world. According to Carter and Little (2007), participants should be encouraged to interact freely with the researcher to form a rapport. The researcher in turn will construct the meaning by understanding the context of the participants (Carter & Little, 2007). In this study a video on preterm infant massage was used as an inductive

approach and focus group interviews and observation as a deductive approach. Another important epistemological aspect is that the researcher's objectivity is not privileged in qualitative research (Hammersley & Atkinson, 1995; Silverman, 2011). The researcher's values, personal experience, background and priorities are a source of credibility and bias; where the researchers should be an instrument for inquiry and be aware of their own subjectivity and embrace it as part of the process (Creswell, 2013; Creswell & Poth, 2017).

With this in mind, the philosophical stance relates to the world view where I live. Being influenced by the discipline that I come from, namely as an NICU nurse, with a professional education and personal experiences as an International Board Certified Lactation Consultant (IBCLC) and acting as an instrument of inquiry, it follows that the family-centred approach to care should be emphasized.

3.3.2 Philosophical worldviews: social constructionism

Social constructionism has been an inspiring methodological approach to qualitative research (Silverman, 2011; Hibberd, 2005). Social constructionists believe that reality and knowledge are socially and culturally constructed through human activity and social interaction (Burr, 2003, 2015; Cohen, Dubberly, & Mallon, 2004; Seal, 2012), not merely through the mind. Burr (2003, 2015) suggests four important assumptions in social constructionism. First, it takes a sceptical critical stance toward the fact that knowledge is taken for granted. Second, our interactions and behaviours are culturally and historically situated and might change and develop over time. In other words, individual performance is based on individual past experiences, situational traditions, the socio-cultural context, and the time and place of the interaction (Seal, 2012; Cohen, Duberley, & Mallon, 2004). Third, knowledge can be created and re-created through social interaction, shared experiences and perceptions. Fourth, knowledge and actions go hand in hand. With these four elements in mind, this qualitative study was approached ontologically, from the viewpoint that our reality is constructed by multiple perspectives or 'realities' (Burr 2003, 2015; Seal, 2012).

The two previous reviews of this researcher have established that there is no published literature that explores facilitators and/or barriers of the MPM application in the NICU from the perspectives of HCPs and parents taking into consideration the cultural and contextual factors. Most of the literature on MPM in the last 40 years, as a developmentally supportive strategy to improve infant behavioural and neurologic outcomes, is mainly derived from a quantitative approach where MPM is usually performed by health care providers. Parents often have limited participation in their infants' care (Poppy, 2009). There are still many NICUs, especially in developing countries, which do not involve parents in the care of their infants. Therefore, this study was designed to explore with participants what they think about massage and what the key elements are from both the parents' and caregivers' psychosocial perspectives, rather than only from the biomedical perspective. This study used focus groups, non-participant observation and reflective journals in the course of rigorous data generation and data analysis, to reflect multiple social realities.

3.4 Description and Rationale for the Qualitative Research Approach Used

Qualitative methodology has gained recognition and popularity in health and nursing research over the past few decades (Creswell, Hanson, Plano, & Morales, 2007; Creswell, 2014; Kania, Porcino, & Vehoef, 2008; Speziale, Streubert, & Carpenter, 2011, Ritchie et al., 2014). A qualitative approach addresses a new phenomenon that is still unclear and cannot be achieved through quantification alone (Kania et al., 2008; Ritchie et al., 2014). A qualitative enquiry is one way of aligning with the MRC modelling phase, informing the design and implementation of future complex interventions (Anderson, 2008; Craig et al., 2008) in the field of infant massage. Qualitative research methods can be thought of as a preliminary stage in the research which can contribute to the development of adequate quantification.

- A qualitative exploratory design was proposed to address the MRC modelling phase. It is inductive in nature and purposefully flexible where knowledge emerges as a result of data generation and interpretation (Maxwell, 2008).
- This will inform the design and implementation of future interventions in the field of infant massage.
- This study is concerned with context and culture and therefore drew on the principles and practice of ethnographic approaches.
- This provided the most appropriate methodology to gain an in-depth understanding of the contextual and organizational factors that might affect the processes of massage application in a Lebanese cultural environment.

The MRC guidance (2008) is useful as a general approach for developing complex interventions and modelling stages. This establishes the need for a qualitative investigation with a specific focus to better understand the complex structure of the intervention in which the knowledge, skills, and values of the care providers along with the context of the intervention and research evidence are integrated (Anderson, 2008). A new guidance format was developed that builds on the process evaluation themes proposed in the 2008 MRC complex intervention guide to identify key process questions that build an evidence base to inform policy and practice (Moore et al., 2015) (Figure 3.1). Contextual factors may shape the theories of how massage intervention works, influence the interpretation of outcomes and affect the implementation processes and mechanisms of impact (Moore et al., 2015; Craig et al., 2008). For instance, the contextual factors may impact how the intervention is delivered, by whom, when, how much and the participants' responses to and with the intervention. Additionally, they can affect the expected outcomes as schematized in Figure 3.1.

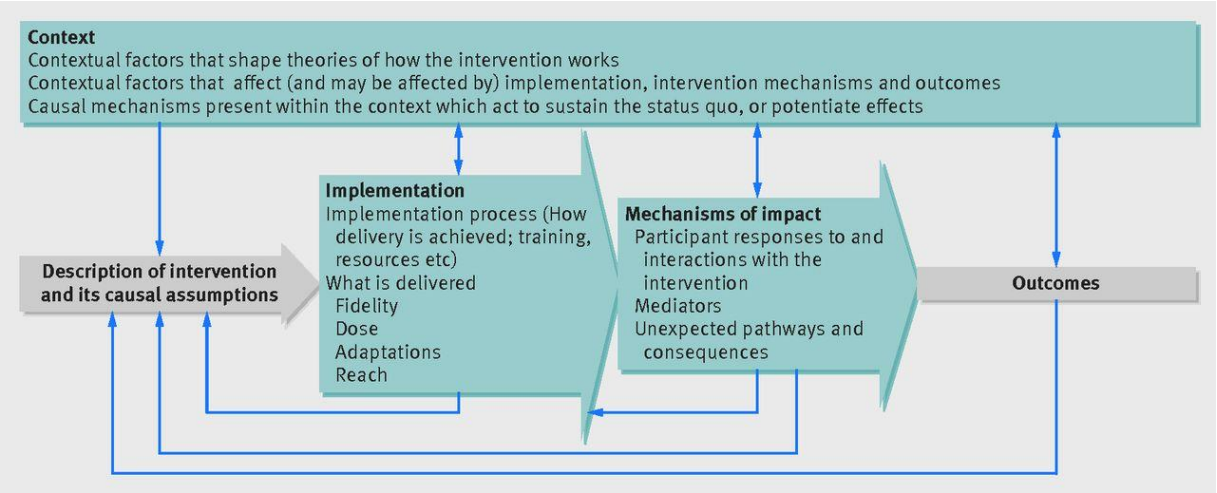

Figure 3.1: MRC process evaluation framework BMJ 2015; 350:h1258

This approach is exploratory and inductive in nature, in that the researcher seeks to listen and discover, frequently with the informant; gaining a new meaning or a new understanding about a social phenomenon, and thus purposefully flexible (Brink & Wood, 1998; Ritchie et al., 2014, Creswell, 2014). Qualitative research seeks to build an understanding of what is known of social facts in a natural setting and to describe the view of participants, not seeking to generalise its empirical findings (Creswell, 2014). According to Parahoo (2014), generalizability in qualitative research is likely to be conceptual rather than numerical. Adopting a qualitative, exploratory approach enables the researcher to enter the participants' natural setting and interpret their perception of the phenomena under study (Creswell, 2009, 2014). In the context of this study, this approach has provided the most appropriate methodology to gain an in-depth understanding of the Lebanese NICU cultural, contextual and organizational factors that might affect the process of MPM application.

3.5 Theoretical framework

The overall purpose of a theoretical framework is to yield meaningful research findings and to allow for the integration of the findings gaining a broader significance and utility of the results (Polit & Beck, 2008). A theoretical framework is a map or a diagram that

enables the researcher to think creatively about the relevant concepts under study. Nursing and qualitative research in particular are often criticised for not being sufficiently theoretical (Bradbury-Jones, Taylor & Herber, 2014). Theory and research should be integrated and made explicit to strengthen the quality of qualitative research (Creswell, 2007). It has been argued that the use of a theory in research strengthens and advances the nursing profession and the application of this knowledge in nursing education, research and clinical practice worldwide (McFarland & Wehbe-Alamah, 2014). Theory can be used in a variety of ways, but it is not always clear in published reports how theory has been used or applied (Bradbury-Jones et al., 2014; Meyer & Ward, 2014).

There are numerous implementation theories that provide explanations of how and why implementation succeeds or fails (Nilsen, 2015) and how to improve the implementation of an evidence-based practice. Yet, there is no available formula that predicts which theory is best to use as the underpinning for implementation research (French et al., 2012). While there are similarities between some of the theories, being aware of the differences is also important to facilitate the selection of the most appropriate approach. Many models are available in the literature to assist HCPs in dealing with implementation issues like the Transtheoretical Model (TTM) and Theory of Planned Behaviour (TPB) (Prochaska & DiClemente, 1986; Fishbein & Ajzen, 1975). After critically reading numerous implementation theories on individual, organisational, and behavioural change (Rosenstock et al. 1974; Bandura, 1969; Fishbein & Ajzen, 1975; Prochaska & DiClemente, 1986; Michie, van Stralen, & West, 2011; Nilsen, 2015), most of them have conceptually overlapping constructs though few provide sufficient details relevant to the perspective of the process of implementation or sufficiently address the barriers and enablers to translate research into practice in healthcare settings. For instance, the Health Belief Model (HBM) focuses on the concepts of perceived susceptibility, perceived severity/seriousness, perceived benefits, perceived barriers, cues to action, and self-efficacy. However, HBM does not take into account behaviours performed for non-health related reasons and the management efforts that might affect implementation. While it

explains why individuals change or maintain specific health behaviours, HBM has been criticised for failing to account for the effect of personal attitudes, beliefs or socially determined or unconscious motivations (Rosenstock et al., 1974).

The TTM is not suitable because it focuses on the stages of behaviour change. The TTM hypothesis is that individuals move through six stages of change: pre-contemplation, contemplation, preparation, action, maintenance, and termination (Prochaska & DiClemente, 1986). The theory ignores the organizational and social context in which change occurs, such as SES and income. Its stages have been critiqued as being illogical (i.e.no set criteria on how to determine a person's stage of change) and with no clear sense of the time frame needed for each stage (i.e. how long a person can remain in a stage). The model assumes that individuals make coherent and logical plans in their decision-making process when this is not always true (Prochaska & DiClemente, 1986).

The TPB was not selected as the theoretical framework for this current thesis because it mainly focuses on attitude as a major influence on human behaviour and socio-cultural norms (Fishbein & Ajzen, 1975). It explains many psychological correlates such as attitude, subjective norms, perceived behavioural control and intention that are likely to influence potential health behaviour (Fishbein & Ajzen, 1975). In addition, it is an individual level theory aiming to empower patients to improve the quality of health care, but ignores the very important influential components to fill the gap between theory and practice which are the organizational efforts of the management and health care providers not only considering intention and attitude. In this dissertation, the TPB was not used as it explores a pre-defined behaviour and not useful when trying to develop an intervention. The main criticism attributed to the TPB is that it focuses on rational reasoning and does not account for unconscious influences on behavior. Despite this limitation, the TPB can be considered a broad framework assisting in the understanding of human action. The Normalization Process Theory (NPT) in contrast is straightforward and has been tested empirically with a clear toolkit to guide researchers in its use (May et al., 2010). The selection of the NPT over other

health behaviour theories is explained in the following paragraphs. The following section will address the predictive abilities of the NPT model and discuss its effectiveness.

The NPT as an "action and sociological theory" was developed to understand implementation and address the observed difficulties in implementing new interventions in clinical settings and accordingly operationalizing evidence (new health technology) (May et al., 2009; McEvoy, Ballini, Maltoni, O'Donnell, Mair, & MacFarlane, 2014). The NPT, as an explanatory analytical framework, is used in implementation science for investigating the routine embedding of complex intervention practices in a social context (May & Finch, 2009). May ("Agency and implementation", 2013) and May and Finch (2009) argue that for any new complex intervention to be implemented successfully and normalised into routine practice, it should be guided by theory and based on accumulated science and evidence. Considering only a few variables when implementing a complex intervention would be unacceptable and could greatly limit obtaining a holistic view and understanding of the phenomena under study. Not considering contextual and organisational variables would influence any attempt to coordinate the involvement of all concerned stakeholders as reflected by shared decision making (May, 2006, May, 2013a).

The NPT offers a robust framework for inquiry by seeking the participants' perspectives on the implementation process to bridge the translational gap between theory and practice. This approach allows conclusions to be drawn regarding why the program might work from both a process and structural perspective (May, 2013a) The NPT allows for the exploration of accepting the MPM as a potential intervention considering key social, political and technical contexts (May, 2013a). It is a framework which ensures systematically and rigorously that the contextual and organisational social system issues are considered.

In this study the NPT was used as an exploratory 'pre-intervention' tool, and as such was innovative. The NPT was useful as a means of prospectively testing MPM implementability in the NICU (pre-implementation). The development of interview questions was designed to explore the specific content of the NPT constructs regarding implementation

issues. The NPT was also used as a coding framework for analysis. In studying the perception of parents and HCPs for future MPM application in a Lebanese NICU culture, the NPT was a beneficial heuristic device to explain and guide implementation processes by: (1) delineating the scope of the phenomenon under study; and (2) integrating the findings, barriers and facilitators for MPM application.

The NPT theoretical model and the MRC framework are closely aligned and complementary (Figures 3.2). They both emphasize the importance of the early phases before developing an intervention to form an understanding of the details of the intervention from key participants, and why the intervention might work or fail in different settings before the actual implementation of an intervention, creating a less fragmentary and more system-based approach (Anderson, 2008; Murray, Treweek, Pope, MacFarlane, Ballini, Dowrick, & May, 2010). Using both the NPT and MRC approaches is likely to strengthen the clinical and translational sciences and lead to sustainable interventions, better-designed processes, and more accurate outcome evaluations.

In this study, the four constructs of the NPT were used as a heuristic device to guide the research questions and methods used and make sense of the findings, rather than as a 'conceptual constraint'. The NPT is typically used as a tool to address the difficulties that have been observed in implementing new interventions in clinical settings considering key social and technical contexts (May et al., 2007, 2009). Its use in exploratory 'pre-implementation' is innovative as it has not been used like this before.

This study was guided by the four constructs of the NPT theoretical model (May & Finch, 2009): Coherence, Cognitive Participation, Collective Action, and Reflexive Monitoring. The first two constructs, "Coherence" and "Cognitive Participation", allow exploration of process issues: the implementation of new ways of thinking, acting and organizing in health care, for instance, understanding how MPM is viewed by key participants, how it differs from existing practices and examining how HCPs and parents "buy into" the idea of infant massage (value, benefits, and risks). "Collective Action" and

"Reflexive Monitoring" enabled the consideration of structural issues: the integration of a new practice into existing organizational and professional health care settings (Figure 3.2). For instance, the roles affected by the innovation and the responsibilities or training needs and contextual integration such as: what are the barriers and facilitators for implementation? How can the benefits or problems be identified or measured? Therefore, there is a need to identify the factors that influence applicability, acceptability and feasibility of implementing MPM in the various Lebanese NICU contexts.

The first construct "Coherence - Sense Making" has the potential to reveal how parents and HCPs understand and make sense of massage intervention - what it is and what it involves. The second construct "Cognitive Participation - Relational Work" will help to address their cognitive participation – the risks and benefits and willingness or reluctance to engage in infant massage. The third construct "Collective Action - Operational work to routine embedding" has the potential to enhance the understanding of how parents and HCPs perceive barriers and facilitators to implementation. The fourth construct "Reflexive Monitoring - Appraisal work to routine embedding" will help to explore other similar parent/infant centred initiatives for massage implementation.

"Coherence" and "Cognitive Participation" are process issues:	"Collective Action" and "Reflexive Monitoring" are structural issues:
The implementation of new ways of thinking, acting and organizing in health care for ex: ✓ Differentiation: understanding of how massage differs from existing practice? ✓ Enrolment: Do individuals "buy into" the idea of infant massage? (value, benefits, risks, how they see their contribution and how they can be involved)	The integration of new practice into existing organizational and professional settings: ✓ How does the innovation affect roles and responsibilities or training needs? ✓ Contextual Integration: What are the barriers and facilitators for implementation ✓ How are benefits or problems identified or measured?

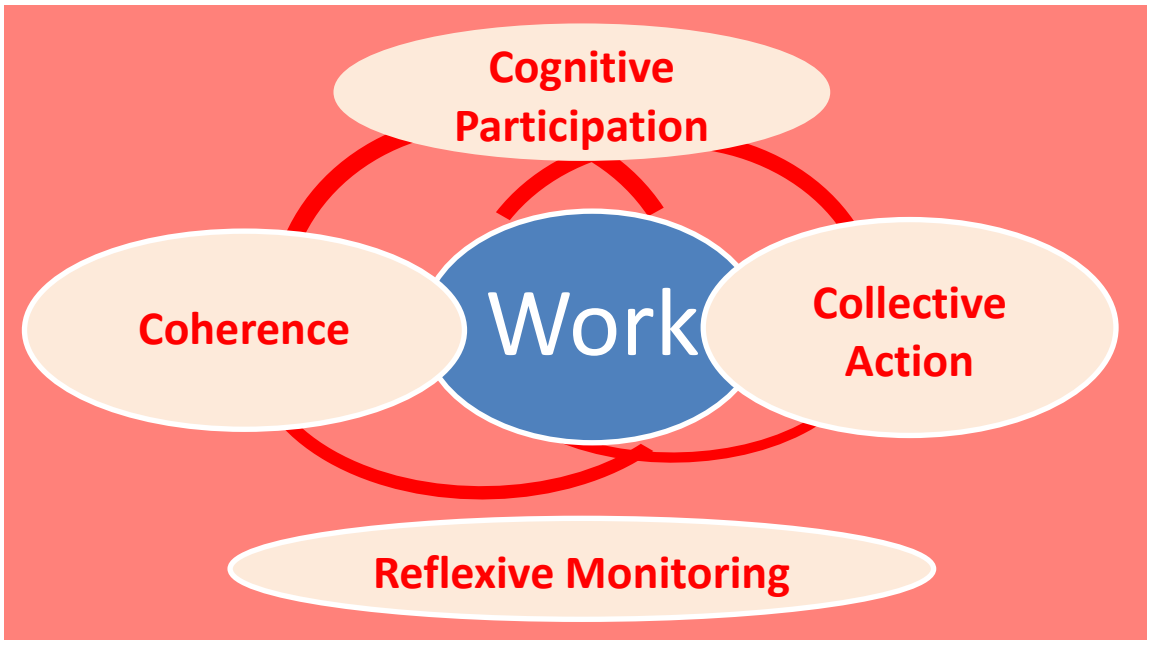

Figure 3.2: Domains of *work* in complex interventions (May et al., 2010)

3.6 Methods

The methods include the study design, setting, sampling, inclusion criteria, sample size, recruitment, data generation, data analysis and trustworthiness.

3.6.1 Study design

An exploratory, qualitative design was chosen to address the gap in knowledge regarding perceptions and attitudes of parents and HCPs towards MPM and the facilitators and barriers that might affect its future implementation, as it is not part of the NICU culture/protocol in Lebanon. Data were generated through focus group interviews with the parents and HCPs. This study is concerned with context and culture and therefore draws on, but is not constrained by, the principles and practices of the ethnographic approach using non-participant observation and reflective journals.

3.6.2 Study setting

Participants were recruited from three university hospitals with different cultural backgrounds; this facilitated the recruitment of a heterogeneous sample. Three different hospital categories were chosen. Hospital A had been designated as a "Baby Friendly Hospital" (FBFH) but had not been reassessed for more than 20 years. Therefore, presumably the lack of reassessment means it is not in full compliance with the principles of BFHI. This reassessment would help to ensure that they maintain their adherence to the "Ten Steps" and the Code over time to ensure continuous mother and baby support (World Health Organization & UNICEF, 2009). Hospital B was not a BFH (NBFH) and Hospital C had just started the process of becoming a BFH (WBFH). However, local assessment was done by the National Committee on IYCF for Hospital C that showed that it is in the early stages for full validation. Two of the hospitals were in the greater Beirut area, of which, the one in the suburbs attracted people from the south, and one was in the city of Beirut, while the third hospital was in the North. The choice of these private hospitals was due to the fact that they usually had high occupancy rates and attracted patients from different socio-demographic and cultural backgrounds and regions. This contributed well to the diversity in the characteristics of the study participants.

The three settings allowed the comparison of the parents' and HCPs' views towards MPM intervention taking into consideration the BFH initiative in the NICU context as a variable that might affect acceptability of the MPM intervention. The staff in a BFH encourages mothers to come to the NICU and mothers are also expected to visit regularly in order to express their milk or breastfeed their infants (Saadeh & Casanovas, 2009; Nyqvist & Engvall, 2009). Therefore, mothers and staff might be more receptive to the idea of the parents' contribution in the care of their infants and to the idea of introducing MPM as a new intervention in the NICU within a BFH setting. MPM would only be appropriate on stable infants. Stable infants are those who no longer receive oxygen support, are placed in the intermediate care section (step down unit for infants with moderate risk not needing ventilator support), and can potentially be massaged by their mothers. In each hospital, there is generally one section in the NICU for intermediate care with at most ten stable infants who are not receiving oxygen, and a separate section for critical care cases receiving oxygen support. Critical babies on a respirator do not tolerate touch and manipulation, also turning the baby would be difficult for parents. The same three hospitals' NICU settings were recruited for the observation as well.

3.6.3 Sampling

Sampling is a complex step that requires careful and critical thinking (Guetterman, 2015; Creswell, 2013, 2014) to answer the research questions. A purposive sample was chosen for selecting participants for the Focus Groups (FG) in line with the study design as well as a convenience sampling. This allowed for maximum diversity in participants to generate meaningfully rich data that could purposively inform an understanding of the research problem (Green & Thorogood, 2004; Onwuegbuzie & Leech, 2007; Creswell, 2013, 2014; Patton, 2015). Using the purposive sampling of parents, doctors and nurses from within the NICU was appropriate to encourage an interactive conversation, maximize the

heterogeneity and reflect on different aspects of the participants' views relevant to the research questions (Guest, Bunce, & Johnson, 2006; Petty, Thomson, & Stew, 2012).

3.6.3.1 Inclusion criteria

The purposive sampling technique was based on specific criteria (Congdon, 2003); all Arabic-speaking Lebanese mothers above 18 years old who had a stable premature infant in the NICU during the time of the study. However, due to the recruitment challenges for creating focus groups with parents, purposive sampling was extended to include convenience sampling, since a limited number of infants met the inclusion criteria in the NICU and some parents were not present on the day of the interview. A convenience sample for quantity and having an infant(s) not in critical condition was adopted and other family members (not just mothers) who expressed an interest in taking part in the study were recruited. Mothers were recruited when their infants were in the NICU because contact after discharge was difficult. Most of the participants' phone numbers were mobile numbers (not landlines) which might be switched off or their account might be closed. Moreover, addresses might be given inaccurately without house or building numbers and some mothers might be living in remote deprived areas without easy access to transportation to join the FG site. However, invited mothers were often accompanied by other members of the family: the father, mother-in-law, sister-in-law, or grandmother. Therefore, the research questions, inclusion criteria, and ethics approvals were modified to include other family members especially if other members indicated that they wanted to be part of the study (refer to section 3.6.6). Therefore, for the benefit of the study and from a cultural perspective to not miss their input since they felt involved in the intervention, it would have been culturally inappropriate to exclude them. Extended family members are a source of support in the Lebanese culture. In fact, the data generated from family members was very meaningful, enriching to the discussions and allowed for maximum heterogeneity of involvement; which is in line with the exploratory nature of this qualitative investigation. This allowed for a more natural interpretation of the

situation and elicited interaction between participants (bouncing ideas off each other); which highlighted the differences in perceptions and attitudes between them.

The HCPs selected in this study were a mix of junior and senior HCPs including licensed practical and registered nurses (LPNs and RNs) and interns, residents and attending physicians who performed various forms of bedside nursing and medical care, had direct contact with infants, and worked at one of the three university hospitals. A purposive sampling strategy was adopted in terms of key characteristics of the available population including education, years of experience and profession to allow for a maximum variation sample and exploration of common and unique perceptions of MPM application across a range of participants. All of the Arabic-speaking Lebanese HCPs were working the day or night shifts in the NICU of the three university hospitals at the time of the study. The level of education and seniority in the job, have been previously found to be factors which can affect the HCPs' perceptions and attitudes to massage and the understanding of the phenomena under study (Mehrdad, Joolaee, Joulaee, & Bahrani, 2012; Stokke, Olsen, Espehaug, & Nortvedt, 2014).

3.6.3.2 Sample size

There is little consensus regarding sample size in qualitative research. A review by Mason (2010) of five hundred and sixty PhD studies using qualitative approaches, and qualitative interviews for data collection indicated that the mean sample size was 31 and it can range between 1 and 95 depending on the individual study design and appropriateness of the data (Charmaz, 2006). Creswell (2013) maintains that the sample size should be sufficient to provide opportunity to identify themes from the participants as well as to conduct cross-case theme analysis. In the same vein, Fusch and Ness (2015) argue there is no "one-size-fits-all" method or formula for data saturation. Although it is difficult to know when saturation, the point at which no new information or themes are observed in the data, is reached; O'Reilly & Parker (2013) as well as Cleary et al. (2014) and Guest, Bunce, and Johnson

(2006) suggest that when all the research questions have been addressed, the sample size would be sufficient. Glaser and Strauss (1967, p.65) defined theoretical saturation as the point when:

"…no additional data are being found whereby the (researcher) can develop properties of the category. As he sees similar instances over and over again, the researcher becomes empirically confident that a category is saturated…when one category is saturated, nothing remains but to go on to new groups for data on other categories, and attempt to saturate these categories also."

As such, the size of the sample can change during a study and the researcher should be flexible (Marshall & Rossman, 2014) as the intent is not to generalize the information, but to continue to recruit till data saturation is reached to explain the specific concept (Pinnegar & Daynes, 2007) and address the research questions. In this study an estimated sample size of 40 (20 mothers and 20 HCPs) was identified to reach saturation and to answer the research questions as detailed in the proposal sent to the Internal Review Board. However, the recruitment continued to 60, until the research questions were adequately covered and no new data were generated from the FGs.

3.6.4 Recruitment

Thirteen FGs in total were conducted at the three sites (4 to 5 FGs at each of the study sites) over a seven-month period (January- July, 2014). This lengthy time-frame allowed an exploratory focus in the FGs at the beginning of the period and those in the latter to be more confirmatory of emerging findings. This is in line with the iterative nature of qualitative research. It was also important for the purpose of triangulation and to address question 5.

After taking the Institutional Review Board (IRB) approval (Section 3.6.6), recruitment was through the nurse in charge (gatekeepers i.e. nurse managers) of each NICU. A face to face meeting was undertaken to take her approval. The rationale of the study and the planned process for recruitment were explained to her; her advice on the best method to

approach HCPs and eligible mothers was sought as well. The eligible potential participants meeting the inclusion criteria received an introductory letter and then a participant information and consent sheet. The same process was followed for HCPs. The study aims were explained by the nurse manager for the participants to make a voluntary choice for their participation in the study. All participants were asked by the nurse in charge to complete the demographic information prior to the FG and to sign a form indicating interest in participation and willingness to be contacted by the researcher. Socio-demographic data pertaining to gender, age, marital status, educational level, occupation, socio-economic status, and place of residence whether rural or urban were also collected in writing from the mothers. Information was collected from HCPs on age, gender and work experience. Those data were provided by the participants before the FG started and were recorded on separate sheets (Appendices 20 and 21). The potential interested participants' details were passed by the nurse in charge to the researcher. The researcher explained to the mothers and HCPs who showed interest in participation the rationale of the study the process of data generation, the risks and benefits, and the confidentiality of the data collected clarifying that their participation was voluntary. Participants were reassured that they could withdraw at any time from the study. When a sufficient number of eligible participants had expressed an interest, the FGs were arranged by phone or by speaking to interested participants in person by the researcher (after receiving their details) or by the nurse in charge. In case of refusal, they were not approached again. The information and consent forms were initially developed in English. The information sheet and the consent form were translated into the native language of Arabic. The HCP participants in this study consisted mostly of nurses. It was initially aimed to generate a wider professional sample, for example medical and managerial staff. Failing to generate this wider sample may have been influenced by the recruitment technique adopted. However, the aim of this study was to generate an in-depth understanding of risk perceptions and responses, which was achieved with this sample.

As illustrated by the participants' questionnaires that were completed prior to the focus groups and interviews, a range of demographic characteristics were obtained. Some of these characteristics, for example age, gender, work experience and level of education, appeared to have little impact on perceptions and attitudes for parents' recruitment within this study. It was important to include these data as initially the topic guide was developed to also aid purposive sampling and therefore, to select participants with a range of characteristics in order to reflect diversity among individuals. As all parents who expressed an interest were recruited, the characteristics were not used for sampling. Therefore, the sampling of parents is better described as one of convenience. For future research, the collection of demographic characteristics should be undertaken only if there is an indication that they are important.

After approval had been gained, the manager was asked to distribute introductory letters (Appendix 18) – a two-part letter to eligible mothers. The first section included information about the purpose of the study. The second section included a tear-off slip to indicate interest in participation as well as contact details and socio-demographic background information about the participants and their infants. Mothers were given at least 24 hours to consider the request before indicating interest to participate and were given the Participant Information Sheet (Appendix 19). A similar process was followed for HCPs; the manager gave the HCPs who agreed to participate the consent form– a two-section form (with an opt-in or opt-out option) (Appendix 20). They were given the Participant Information Sheet and time to consider the request and give full consent (Appendix 21). Potential participants were asked to return the tear-off slip to the NICU ward. The tear-off slips were then collected by the researcher.

3.6.5 Data generation

Data generation were performed in a flexible naturalistic environment to respond to the research questions and to capture the participants' deep understanding of infant massage within the NICU environment. Three different methods were used to generate data. The first

method was focus groups. FGs were held for two different participant groups; parents and HCPs. The second method was observation in the NICU setting and the third method consisted of a reflective journal. These sources of data were complementary to one another and provided an understanding of how participants perceived the idea of infant massage and the anticipated facilitators and barriers for its application; this information helped in determining the cognitive, social and behavioural drivers of HCPs and parents that are grounded in the social NICU environment (Gopaldas, 2016; Polit & Beck, 2010; Scotland, 2012). This approach is defined as triangulation, congruent with the philosophical stance of social constructionism and served to generate meaningful rich data (Mason, 2006; Loiselle, Profetto-McGrath, Polit, & Beck, 2007; Creswell, 2012) that was thematically analysed using a well-established analytical framework.

All of the focus groups as well as the observations and field notes were conducted by the researcher (BA). The process of actively collecting data as a researcher allowed for a better interaction with the participants and to embrace the participants' world. According to Richards (2009), the researcher's interaction with the participants during data generation in the field and the way he/she describes the NICU context through field notes are key factors to get rich data using the interpretive process. Each method of data generation will be described in turn in the following section.

Data Generation: between January and July 2014

- 13 Focus Group prompted by a video about infant massage
    - Parents (7)
    - HCPs (6)
  - Digital audio-recordings, field notes
  - Topic Guide

- Observation in the NICU setting
    - Reflective Journal was kept through the process

3.6.5.1 Focus group discussions with mothers/parents and HCPs

The first method of data collection was focus groups. Qualitative data can be collected through interviews or FGs. The advantage of FGs is that they have the potential to produce substantial information in a fairly short period of time and approximate a more "natural" interaction than individual interviews (Green & Thorogood, 2004; Jayasekara, 2012). In this study FGs were chosen because they play an important role and are widely used in health care research to discuss a particular issue and to gather a broad range of responses (Green & Thorogood, 2004; Holloway, 2005; Ayala & Elder, 2011; Carlsen & Glenton, 2011). FGs of six to eight participants allows the participants to describe a common topic or phenomena in their own words and to explore issues such as similarities and differences between individuals and groups, peer sharing and group norms (Sullivan-Bolyai et al., 2005; Nicholas et al., 2010; Then, Rankin, & Ali, 2014). FGs are also ideal for gathering naturalistic data on how knowledge is formed in social interaction and for accessing cultural norms and how they are reproduced in everyday conversation (Green & Thorogood, 2004; Barbour, 2007). FGs are commonly used with a small number under the guidance of a facilitator using a topic guide (Green & Thorogood, 2004; Merryweather, 2010). They can be used to generate data and as a confirmatory tool for the validation of data. It was through group dynamics that the researcher was able to explore the participants' views, experiences, and concerns regarding the processes of future implementation of MPM in Lebanese NICUs in greater depth. Moreover, because MPM is a new topic to the participants, the experience of taking part in the FG and interacting with other participants sharing the same experience may clarify, elaborate and even change the participants' views (Green & Thorogood, 2004). This might not have been achieved through one-to-one interviews.

The FGs were moderated by the researcher and conducted at a time convenient to the participants in each hospital setting in an undisturbed location. Each FG lasted between 60-120 minutes. At the start of the FGs, the participants signed the consent forms. At the beginning of each FG, participants were reassured that confidentiality would be maintained (what was shared in the room stayed in the room), they would remain anonymous, and they had the right to withdraw at any time from the study. All FGs were audio-recorded. As MPM is not a common practice in Lebanese NICUs, the FGs were initiated by watching a video about infant massage in an NICU setting designed originally by Field et al. (1987) in English, though muted and translated verbally by the researcher in order to prompt the discussion. Showing the video enabled the participants to relax and acted as an ice breaker. It also served to provide an operational definition of MPM and stimulate the initial discussion (see Appendix 9).

A note taker, a colleague and lecturer from the University of Balamand who had previous experience in conducting interviews and FGs, was present to observe and document group interaction and non-verbal communication. This process helped check whether the researcher had faithfully and correctly recorded the participants' views (Patton, 2015). Refreshments were offered at the beginning of each FG to make the environment friendly and comfortable. The participants were informed that the findings of the study would be potentially disseminated to the concerned hospitals, used in conferences, and published in journals as MPM is not currently applied in the NICU. To be noted, however, the mixing of junior and senior HCPs in one group had one disadvantage in that it could be potentially intimidating for junior members, who might not feel at ease speaking out and expressing their honest opinion or disagreeing with senior HCPs. Aware of and sensitive to this disadvantage, I prompted all participants in the group to contribute and share their points of view (Kitzinger, 1995). In addition, another potential limitation could be the dominance of one or two members in the group. Some participants can at times be more vocal and dominant contributing more than the others in the group and stifling others' contributions, therefore this

must be recognised. However, I tried to actively engage all participants in the discussion by asking their opinion and giving them time to reflect on the discussion. Participants taking part in focus groups may not always express full or honest opinions about a topic, particularly if they oppose the views of other participants. Nevertheless, it was established from the literature review that perceptions and attitudes towards an innovative intervention in the NICU such as MPM are socially constructed therefore using focus groups enables the illumination of the way in which participants interact with each other, share their views, make sense of issues impacting how they construct and modify their perceptions and attitudes.

In this study, the FGs of Lebanese NICU HCPs and parents formed the primary means of data generation to reflect the various thoughts and views on the specific topic. If any participant requested an individual interview rather than a group interview, for the purpose of being inclusive, the researcher was prepared to be flexible, and accommodate the request where possible. However, this was not necessary as no requests were made.

3.6.5.1.1 Topic guide

A topic guide was used for mothers/parents and HCPs to generate data by using minimally structured open ended, general, and focused questions to understand the phenomena under study (Appendices 22 and 23). One topic guide was used with mothers/parents (addressing questions 1, 3, 4, 5) and another topic guide was used with HCPs (addressing questions 2, 3, 4, 5). Mothers/parents and HCPs were asked to respond to the questions describing their perceptions of MPM and the facilitators and barriers to its application in the NICU. The topic guide was used flexibly and amended as the interviews progressed to orient the interviewer to the areas to be covered with four main open-ended questions designed to reflect the four NPT constructs. The questions for the FG were constructed and evaluated for their cultural sensitivity by the nurse manager of the NICU and by a faculty member at the Faculty of Health Sciences, UOB.

The questions were validated through pilot testing in the NICU setting with HCPs that were not included in the FGs. The questions were then amended for cultural congruence. This was done to ensure that all questions were acceptable, clear and could be understood by mothers and HCPs with the potential to produce relevant information to answer the research questions. Following the pilot FG with HCPs and the preliminary analysis of the data, minor changes were made to improve clarity. For instance, the third question "If we were to implement MPM in the next 6 months, what would it take as key issues to account for successful implementation?" in the interview guide needed elaboration after pilot testing as it did not include a timeline nor provide a clear picture of what were the key factors that would lead to a successful implementation of MPM in the NICU.

If the participant response to the initial question did not cover certain topics of interest, the researcher probed inductively on key responses (Ritchie & Lewis, 2003). Probes were used during the FGs to solicit more in-depth information from the participants. Probes can take the form of a gesture or a brief comment made by the interviewer to keep the conversation going or to prompt the interviewee to elaborate further on the question asked, as suggested by Seidman, Rubin, and Rubin (2004). The probing questions used were: What do you mean? Can you elaborate more? Do you all agree? Anybody have a different opinion? I did not hear you giving your opinion. This probing was undertaken to involve all participants and moderate the participants who were trying to dominate the discussion. This allowed for the creation of a relaxed ambience, the establishment of a rapport with the participants, and the formation of lively group interactions (Holloway, 2005; Dundon & Ryan, 2010).

3.6.5.2 Observation (addressing objective 3, 5 and 6)

The second method of data collection was through observation in the Lebanese NICU setting. Observational data are believed to produce the most valid data on social behaviour with considerable contribution to qualitative methods in health research (Green & Thorogood, 2004; DeWalt & DeWalt, 2011). Observation is commonly used in ethnography

(Hammersley & Atkinson 1995; Emerson, Fretz, & Shaw, 2001) to provide data on what people do, as well as what they say they do (Green & Thorogood, 2004; DeWalt & DeWalt, 2011). It is also relevant for capturing non-verbal behaviour (Cohen, Manion, & Morrison, 2003). It serves to enhance the quality of the interpretation of data collected from different sources (DeWalt & DeWalt, 2011). It positions the researcher where the action is and allows the generation of data relative to the setting, events and people to better understand the nature of the phenomena (Atkinson & Coffey, 2003; DeWalt & DeWalt, 2011).

Qualitative studies use informal participant observation (Robson, 2011). Informal observation is when the researcher is the instrument and the data are the interpretations of what is seen by the observer (Petty, Thomson, & Stew, 2012). In this study observation was used to confirm or refute the data generated in the FGs. This ethnographic technique of observation was used as a way of revealing the NICU organizational context, physical structure, social norms, group processes and conventions with a description of regularities in social behaviour. Observations were made about the physical and social environment, staff interactions, staff capacity, staff supportiveness to parents, group dynamics, and the extent to which mothers engaged in the care of their infants. For instance, observation of the current HCPs' behaviours, activities, and interactions with parents captured how decisions were made, how the team worked, the HCPs' interaction and collaboration with each other and with parents, whether parents were included in decision making, and the extent to which parents had contact with their infants. The aim of the observation was to gain a better understanding of the NICU daily activities in which the HCPs operated in their routine work day and where parents were occasionally present.

Between January-July 2014, I was engaged in informal, non-participant observation of the NICU environment, with no direct contact or delivery of care to infants or any managerial activity. The observation was undertaken over a period of six months after obtaining permission from the nurse manager from each of the three hospitals who introduced the researcher to the members of the staff before entering the NICU setting. An information

sheet was available to parents and HCPs of the unit (at the nurses' station and posted on the board available to parents and HCPs) explaining the study aims and objectives (Appendix 24). Regarding this point, the opinion of the UOD research ethics Committee (UOD-UREC) was sought concerning the level of consent required for participants (refer to section 3.6.6). They concluded that permission from the hospital and the responsible clinical staff of the unit would suffice, as long as everyone was made aware that I was simply recording reflections in relation to the study aims (Appendix 25). Everyone, including both staff and parents, who was present on the day of the observation, was informed that during the observation if anyone felt uncomfortable, they could contact the researcher or the manager to arrange the observation during a different time shift. However during observation, nobody reported any discomfort and the researcher did not receive any individual requests to reschedule the observation.

Observations were undertaken in the three hospitals for four sessions in each hospital, two times per week for two hours during different work shifts (day shift from 7:00-3:00 pm and evening shift 3:00-7:00 pm) over a six-month period to assess naturally occurring situations during the routine care in the NICU. I moved around the NICU environment making unobtrusive observations to avoid disrupting the flow of work as well as observing the HCPs' approach to care, and how they might endorse aspects of any new intervention for preterm infants. New insights emerged from this time spent in the field helping to better understand the NICU routine practices in which HCPs operate with each other and with parents and how MPM could be implemented as a new intervention. Engagement in non-participant observation in the NICU before and after the FGs over the six-month period helped to better understand the factors that might facilitate or impede the application of a new intervention such as MPM in the Lebanese NICUs. Some notes and written comments were recorded discreetly in the presence of others at different occasions during the observation in order not to forget any salient data (Green & Thorogood, 2004). However, the greater portion of notes were taken immediately following these observations on what was being said,

describing what was going on, and who was doing what and how as well as describing regularities in social behaviour rather than just the feelings or impressions about the setting i.e. established routine, HCPs' thoughts, interaction observed between group members, the reactions of the staff to new interventions and personal thoughts. Explicit observations were recorded to capture the subtle details and interactions that served to answer the research questions.

I was in the NICU at different times for recruitment and data collection, to liaise with stakeholders to facilitate the enrolment in the FGs, and to assimilate with the environment. This was also used as an opportunity to engage in the observational aspects of the study. One potential disadvantage was that the presence of the researcher may have influenced behaviour (Petty, Thomson & Stew, 2012). Nonetheless, this method had valuable application to observe theory-in-action, rather than just espoused theory as highlighted by Petty, Thomson and Stew (2012). It allowed me to collect directly observed rich data over a short time period (Cooper, Lewis, & Urquhart, 2004).

3.6.5.3 Reflective Journal

The third method of data generation was a reflexive journal that was kept to facilitate the recall of decisions made during the study. This served as an audit trail and reflective self-examination as part of confirmability. Keeping a personal diary and a log are part of the methodology used in qualitative enquiry. Reflexivity is at the core of most qualitative approaches. This encourages critical reflection by the researcher using these tools, which in turn leads to more rigorous qualitative studies (Bradbury-Jones, 2007; Perkins, 2013). A diary of field notes was kept throughout the study to record events of daily life and points of interest as well as the researcher's own initial interpretations, comments and opinions. This reflective journal included analytical reflections about the whole process of the research project. The field notes and transcripts were continually reviewed and used for both tacit and explicit information in analysis and writing (DeWalt & DeWalt, 2010). Using a journal is one

way of ensuring rigour in qualitative research because it allows for, as described by Bradbury-Jones (2007), an enhanced opportunity for the critique of the research process.

In an effort to understand the parents' and HCPs' perceptions of infant massage, it was important to acknowledge personal biases and experiences that might influence the interpretation and analysis of the data. The parents and HCPs were approached with an assumption that each participant had different perceptions, attitudes and values about the idea of touch and infant massage. For instance, an assumption was made that parents might be anxious about the NICU environment and touching their premature infant, and that they might have other concerns as well. For instance, if parents asked general questions about infant care, feeding or breast milk expression, these questions were openly answered and given time at the end of the FG interview to elaborate on lactation or any other issue that needed more clarification and the researcher's phone number was given for any additional follow up. During the FGs, the initial focus was on the study and their perceptions about MPM as a new intervention to be practised by mothers/parents in the NICU. Then the focus in the discussion evolved to explore the implications of introducing MPM in the current NICU practice and policies and the difficulties that could be encountered due to staff overload, transportation issues or other concerns articulated by the participants.

3.6.6 Ethical approval

Ethical approval was obtained from the Institutional Review Board of the University of Balamand (IRB-UOB) (Appendix 29). The proposal was also approved by the University Research Ethics Committee at the University of Dundee (UREC-UOD 14002 Abdallah) (Appendices 26 & 27). Permission was additionally gained from the hospital and nursing directors, head of the NICU Department, and the nurse in charge, to recruit mothers for the FGs and data generation, in addition to the HCPs. Approvals were obtained according to the hospital line of authority.

This research was guided by the Research Governance Framework for Health and Social Care and the advice pertinent to nursing research from the University of Dundee to ensure that the ethical procedures were in place. The nurse in charge in the three hospitals was approached to ask the team members and parents if they were interested in participating in the FGs. Prior to any data generation, participants were requested to sign a consent form (Appendix 18 for participation, 23 for Observation). All consent forms and all data were collected in the Arabic language. All parents and HCPs who were interested in participating in this study were given a briefing about the main objectives of the research prior to signing the consent form. No participants refused to consent. Consent forms were collected prior to data generation. Participants were reassured that audio recordings would be securely locked away and would be destroyed two years after the completion of the study.

The main ethical issue related to this study was the relative vulnerability of some participants, particularly mothers coming to the FG shortly after having a C-section delivery who were emotionally sensitive. There was a slight chance that involvement in the study could produce some degree of emotional discomfort or stress to some vulnerable mothers and that sharing experiences may be upsetting for some participants. As an experienced registered nurse and a qualified Internationally Board Certified Lactation Consultant (IBCLC) since 2011, the researcher moderated each FG and was attuned to the nuances of the interactions; alert to any upset among participants; and competent to deal with any situations if they arose. For this reason, time was allocated for de-briefing/discussion at the end of all interviews for any participant who wanted to take advantage of this opportunity. Several participants asked questions at the end of the FG and took the researcher's phone number in case of any further queries. Moreover, the contact details of a local clinical psychologist were also made available. It is well-known that FG interviews provide the potential for participants to reflect on experiences in a non-judgemental environment that fosters mutual support and care (Kitzinger, 1995; McLafferty, 2004; Dundon & Ryan 2010).

Non-participant observation was undertaken by obtaining permission from the hospital and the clinical staff in charge of the unit. Prior to observation, permission from the hospital and the clinical staff who ran the unit (gatekeepers) was sought. At a pre-arranged time approved by the hospital administration, the researcher visited the NICU unit in each hospital. The observation started after the nurse manager introduced the researcher to the team members and explained that the rationale for the non-participant observation was to observe team work in the NICU and not individual performance. However, it was difficult to gain consent from everyone on the unit at any one particular time. Therefore, in keeping with other similar studies where group ethical consent has been taken (Goodwin, Pope, Mort, & Smith, 2003; Pope, 2005; Merrill, Rhodes, Deyo, Marlatt, & Bradley, 2002), the researcher ensured that all those present on the unit were aware that she was there as a researcher who was simply recording reflections in narrative format in a reflective journal that contributed to her research. It was explained that extracts from the personal diary would be used to assist in the evolving understanding of the culture of the unit, but patients' files or nursing or medical documentation would not be accessed. Although some general observations may be reported during dissemination (such as in this PhD thesis), complete anonymity was assured for all those in the unit at the time of the observation. The researcher made her presence clear with overt entry to the NICU setting. That the potential participants understood the observations were going to be anonymous and the research was bound by a code of conduct on confidentiality was emphasized (refer to section 3.6.4). As the researcher was a nurse with many years of experience in the NICU and had several professional acquaintances, being an "insider" facilitated the initial entry to the research field whilst it did not guarantee continued access. On the other hand, being a health professional and a nurse provided a level of familiarity with the setting.

A retrospective approval had to be sought from IRB-UOB and UREC-UOD for the participation of other members of the family who showed up on the day of the interview and

showed interest in participating. This was granted, giving permission to include additional members of the family in the study (Appendix 28).

3.6.7 Data management and security

All sources of data were treated with confidentiality and signed informed consent forms were securely filed in a locked drawer or password protected computer. Digital audio-recordings, field notes, written transcripts and their translations, the signed consent forms, and electronic data files were accessible only to the researcher. Non-participant observation and FG interviews were coded and a log of the codes with identifiers was kept in a separate file that was password protected. Furthermore, pseudonyms to maintain the anonymity of participants were utilized in addition to codes for the recorded digital FGs, field notes, transcripts, and translations. Codes, pseudonyms, and telephone numbers were recorded in a separate notebook and kept in a separate locked drawer different from that of the field notes and transcripts. The investigator alone managed the data.

The consent forms were kept in a locked cabinet in the central administrative office of the Faculty of Health Sciences-UOB (FHS-UOB). This office of the faculty is a restricted area closed to the public at all times and only authorized personnel are allowed in. The consent forms were kept in a separate place from the data (tape recorders, FG interview script and notes from observation and FGs) and will be destroyed at the end of the study. Audio-files of the FGs and interviews were stored in a locked cabinet and will be erased two years following the completion of the research according to UOB IRB guidelines.

3.6.7.1 Translation process

A professional translator, a native speaker of the Arabic language, with professional credentials in English was in charge of translating all the documents from English into Arabic. The content of the Participants Information Sheets and the consent forms were translated back into English by an independent qualified person unaware of the original

English form following WHO-Process of Translation and Adaptation of Instruments (Process of translation and adaptation of instruments, 2017). The FGs' responses were transcribed in Arabic to reflect the authenticity of findings and then translated into English by the researcher. Back translation into Arabic for some of the quotes was undertaken, following WHO strategy, in parallel by an external scholar who has expertise in translation and knows both languages and their cultural backgrounds. Corrections were needed for some terms to guarantee the issue of concept equivalence during translation and that the meaning was preserved in the translation process. The Arabic language is characterized by being diverse and rich in metaphors and thus the interpretation might differ from one language to the other (Al-Amer, Ramjan, Glew, Darwish, & Salamonson, 2016). For instance, corrections were needed for some terms to ensure consistency; the word "Malhislo مَلْحِسْلو" which was sometime used by the participants might have a different meaning in English such as "fondling" or "caressing". Therefore it was necessary to search for an accurate and equivalent word in English that had the closest meaning (Regmi, Naidoo, & Pilkington, 2010). "Caressing" was used instead of "fondling" as the latter word can have slightly negative/inappropriate/sexual implication in English. Another correction was suggested by one father who perceived the concept of rubbing/massaging for a preterm infant as culturally shocking/striking. As the word "rubbing" is more linked with strong pressure on the body, he suggested replacing it by another word and derivative from massage such as "caressing" or "stroking" for cultural sensitivity. For him, the term 'massage' was not acceptable as an idea for the "fragile" premature infant. Another example is the word "Maelejeladeh" that was used by some participants and has no equivalent meaning in English. The closest meaning was "do not feel like doing it". Another example, in relation to the application of massage by parents, involves quotes such as: "parents with low IQs". These could be simple words saying that some parents come from a low educational background and might have difficulty in following instructions rather than illustrating any nurses' judgmental attitude towards the parents. Such comments were generally evaluated in relation to the conversation.

Although some of the meanings might have been lost during translation, efforts were made to ensure that the issue of concept equivalence was preserved in the translation process (Denzin, 1989; Regmi et al., 2010; Temple, 2002). According to Temple (2002), the translator has to ask whether the concept is equivalent or similar to one that we can frame in another language. The researcher was aware of the challenges of working between languages. However, to ensure cultural equivalency, guarantee conceptual equivalence, and maintain consistency in translation, a glossary for Arabic and commonly used constructs was developed that had different connotations in the Lebanese context. The use of meaningful constructs for the culture allowed for more valid and reliable meaning outcomes in light of cross-cultural influences (Brislin & Freimanis, 2001).

3.6.8 Data analysis procedures

Data generation, transcription, analysis and translation took place simultaneously. The data was carefully read and reread, sorted, coded, and classified into categories based on emerging themes. The information was interpreted and synthesized in line with the objectives of the study.

Qualitative data analysis is a conceptual process, iterative in nature, which allows the researcher to move the data back and forth and needs critical thought (Ward et al., 2013). Qualitative data analysis is often criticised for its opacity, therefore, Furber (2010) and Dixon-Woods (2011) emphasise the need for transparency in qualitative data analysis and the ability to track how the findings were derived; knowing that subjectivity is an inherent characteristic in qualitative research (Ward et al., 2013). Framework Analysis has been used widely in many settings particularly in health care and applied research (Taylor et al., 2013; McEvoy et al., 2014) to manage and thematically analyse qualitative data due to its clarity, transparency, flexibility and methodological rigour (Ritchie & Spencer, 1994, 2002; Ward, Furber, Tierney, & Swallow, 2013). According to several researchers, FA can be viewed and judged by people other than the primary analyst (Srivastava & Thomson, 2009; Swallow, Lambert, Santacrose, & Macfadyen, 2011; Ward et al., 2013).

There are many forms of data analysis; however, Framework Analysis was chosen as it is generative (driven by the original accounts and observations of the people it is about), dynamic, systematic, comprehensive, allows for easy retrieval from the original material, and allows theme-based analysis within and between FGs (Srivastava & Thomson, 2009; Swallow et al., 2011; Ward et al., 2013). This helps to describe and interpret what is happening in a particular setting and provides a clear audit trail of how data are moved from interview to transcripts to themes to charting, and the use of summarization enables investigators to discuss the progress of the analysis (Ritchie & Spencer, 1994; Ward et al., 2013).

FA consists of five interconnected steps that include familiarization; identifying a thematic framework; indexing; charting; mapping and interpretation (Ritchie & Spencer, 1994). Data were sifted, charted and sorted into key themes and subthemes (Srivastava & Thomson, 2009). This process generated a number of themes relating to the parents' and HCPs' perceptions and attitudes towards future MPM implementation in the Lebanese NICU culture. It also guided the researcher in "defining concepts, mapping the range and nature of phenomena, creating typologies, finding associations, providing explanations, and developing strategies" (Ritchie & Spencer, 1994, p.186). This framework allowed the analysis and interpretation of the data to be undertaken from the initiation of the FG fieldwork, in addition to during and after data collection (Ritchie, 2003). This helped to start the exploration of data and development of themes to give direction to additional fieldwork.

The process of data analysis follows the work of Ritchie and Spencer, (1994) and Ritchie and Lewis, (2003) i.e. indexing, charting, mapping and interpretation of all data from the FGs, observations and journal relative to each of the 5 stages as described in the following section.

3.6.8.1 Familiarization

Immediately after the FG interviews, audio-recorded interviews in the Arabic language were transcribed first into Arabic to reflect the authenticity of findings. According to Oliver et al. (2005), transcribing is a fundamental step that affects future representation of the data and concept formation. Data analysis was on-going throughout the research period. This iterative process led to the emergence of a coding template for analysis of the data. The full transcripts were then translated into English by the researcher using word processing software. The field notes and observation notes, however, were written directly in English. The transcripts, field notes and observation notes were read and reread in order to become completely familiar with the data and to help develop the codes and indexing frame in the Framework Analysis process (Ritchie & Spencer, 1994). Preliminary coding was undertaken first in Arabic and then in English for the first two transcripts of HCP FGs, translated to English and shared with two of the researcher's supervisors independently to start simultaneous coding. It started initially with 151 codes, later reduced following a number of iterations of sifting, sorting and removing of duplicates. As suggested by Lincoln, Lynham, and Guba (2011), this approach was used to look for similarities and differences between expert and novice researchers in order to discuss emerging findings; it also served as part of the audit trail, credibility check, and inter-rater reliability for rigour of the process. The next phase moved from familiarisation and preliminary coding to coding from the data generated through the FG interviews with parents (22 participants) in seven FGs and HCPs in six FGs (38 participants).

3.6.8.2 Identifying a thematic framework

The thematic framework was constructed by the codes that emerged from a sensitising framework included in the interview guide underpinned by NPT theory including emerging issues raised by participants and recurrent views and experiences as well as the observation notes taken from the field and memos. For instance, observation data were incorporated in the

analysis chapters relating to the parents and HCPs adding greater depth through an additional perspective in order to confirm or negate the interpretation of the data.

The transcriptions were carefully examined and re-examined by the researcher; patterns were selected and themes were identified. The first thematic frame for the first FG is displayed in Appendix 30 and served as a guide to organize data with the different themes and subthemes coded by numbers. It was then adapted for the rest of the transcripts. Recurrent subthemes were highlighted from the data for credibility, and confirmability. A code book was developed by the researcher using a standard iterative process. Quotes from the different FGs and the observations were integrated into the findings. Themes were formed as a result of condensing pattern codes and succinctly summarizing and reducing data in an analytical framework. Each quote was referred to by participant and page number. Creating brief summaries that were linked to actual quotes in transcripts for a clear audit trail was very helpful. Detailed files were kept for the parent and HCP FGs, in which quotes were mapped to the research questions, themes, and subthemes to keep track of all the quotes so as not to lose any vital data or evidentiary material.

3.6.8.3 Indexing

The framework was applied to all transcripts, with the coding carried out on the left margin of the documents. Typed notes of observations were thematically analysed by the same framework and were used to support findings. Deviant cases were accounted for within the explanations of the data. The transcripts, observation field notes and the reflective journal were carefully scrutinized using analytic induction. In this way, findings were synthesized and compared across the different sources of data. The inductive analysis generated a number of themes and subthemes and allowed the emergence of four constructs of meaning in line with the research questions and the NPT. In this step, the researcher used the research questions to provide a guideline to draw comparisons between and within the FGs and to look for similarities and associations. Data reduction and condensation or regrouping of themes

and subthemes was completed when all the data were present and summarized. Then the researcher highlighted the differences and similarities across and between the data in the FGs; whether they came from HCPs or parents, and specified from which hospital. Decisions at this stage were based on similarities, idiosyncrasies and differences between initial themes and subthemes (Richie & Lewis, 2003).

3.6.8.4 Charting

An excel sheet was created for charting where the themes, subthemes and verbatim quotes were incorporated in the relevant box with reference to the FG and page number for easy tracking of the original data (Appendix 31). The most representative quotes were included to convey the participants' insights and views that were grounded in the data and allowed for interrogation of the data for contradictions and similarities. The researcher went through a rigorous process of coding, charting, and analyzing the themes within and across the data (Ritchie & Spencer, 1994; Ritchie & Lewis, 2003). Discussion with supervisors was undertaken throughout the process of data analysis. Decisions were made with supervisors at different stages to combine themes and subthemes. This iteration was undertaken using different versions of word documents in which codes were fit together and collapsed in a meaningful way.

3.6.8.5 Mapping and interpretation

This step required sifting of data and refinement of the themes and subthemes. Mapping and interpretation were guided by the research questions and the themes that emerged with reference to the NPT and the literature (Appendix 32). In-depth probing was carried out to elucidate the patterns, interconnections and associations between and across the FGs to draw conclusions (Ritchie & Spencer, 1994; Ritchie & Lewis, 2003). There was a challenge regarding how to condense the data and tell the story while staying true and faithful to the data. In this critical process, the researcher had to exercise careful judgment in order to

present a holistic view of the data and not get lost in the details; a lot was left behind with only a small portion being utilized. What remained as a representation was verified to be scientifically grounded reflecting the essence of the data. During data analysis, several monthly meetings were conducted with the supervisory team to reflect, compare and contrast emerging themes (Appendix 33). The influence of personal views on the findings and interpretation of the data were also discussed during the meetings. Quotes from transcripts were used to demonstrate how parents and HCPs perceive and understand infant massage, allowing the analysis to emerge from the data and yielded four themes that are discussed in the analysis of chapters 4, 5 and 6.

This process of data condensation and mapping required creativity, robust analytical structure and iterative processing to represent the data in a trustworthy manner (Holloway & Biley, 2011) as qualitative research can include vast amounts of data. Finally, peer review with colleagues and the supervisory team was conducted for corroboration and verification of the themes and subthemes.

3.6.9 Establishing the trustworthiness of the data

Guba and Lincoln (1994) suggest using the term "trustworthiness" in qualitative studies to ensure rigour and increase confidence in the data. Judging the quality of qualitative research is a complex issue as the means by which the credibility is enhanced are varied (Flick, 2007). Various methods can be used by the researcher in qualitative research to ensure trustworthiness, such as: triangulation, prolonged engagement as researcher in the field, reflexivity, and member checking. Other methods include an audit trail and keeping a reflective journal as the concepts found in the study would be transferable (Green & Thorogood, 2004). Credibility, transferability, dependability, and confirmability were used in this study to assess the rigour of the research. It is equivalent to internal and external validity, reliability and objectivity in quantitative studies (Sandelowski, 1993; Guba & Lincoln, 1985; Guba & Lincoln, 1989). The descriptive and interpretive rigour of this study was assured in

the analysis of non-participant observation, reflective journal, FGs, and data as interpreted by the researcher (Creswell, 2009; Hammersley, 1992). The following section will discuss how each of these methods was used in this study.

3.6.9.1 Triangulation

Ritchie (2003, p.43) defines triangulation as the use of different methods and sources to cross-check the integrity of, or extend inferences drawn from the data. In the literature, many authors stress the necessity for using more than one method of data collection in a study (Parahoo, 2014). Triangulation is not only aimed at the validation of data by comparing the results from these different data sources, but also to widen the researcher's understanding of the phenomena under study by mixing different methods of data collection so that different viewpoints can be amalgamated on a topic (Mays & Pope, 2000; Olsen, 2004; Farmer, Robinson, Elliott, & Eyles, 2006). In this study, triangulation was used to answer the research questions and to enhance the researcher's understanding of the phenomena as well as the main bedrock to establish validity of the data generated (Ritchie, 2003).

Data triangulation from the different sources was helpful in assessing the usefulness of the NPT for explaining the processes at play for the future implementation and integration of infant massage in Lebanese NICUs. Triangulation was used to explore the data about the setting, events and people to better understand how parents and health care providers perceived the idea of infant massage. This process contributed to a better understanding of the personal opinions of the HCPs and parents regarding MPM for preterm infants in the NICU. For instance, the data were supported or refuted by the observation done in the NICU. Therefore, observations, FGs and field notes were instrumental in adding depth and enhancing the understanding of social interactions in the NICU setting, and thus increasing the validity of the study. This will be evident in the following chapters.

3.6.9.2 Prolonged engagement as researcher in the field

Having completed nursing studies in Lebanon and having work experience in NICUs since 1992, I have experienced much of what other NICU nurses face in their workload and the NICU culture. It was also clear that being a nurse and a researcher might pose a challenge to balance the two faces of the insider and the outsider points of view. The "emic perspective" as defined by Holloway and Todres (2006, p. 210) is the perception of those who are members of a particular culture or group i.e. the native or insider point of view. In other terms, I was familiar with the culture being studied. Therefore, I would like to share an anecdote reflecting on my experience as a registered nurse working in the NICU in Lebanon prior to this research providing an insider's view. While caring for critically ill infants, I used to steal some time to go to the intermediate care (IC) unit in order to hold a stable premature baby next to my chest and massage him gently back and forth over his back and extremities. The premature infant appeared to become relaxed as a result of the smooth stroking and kneading-type movements up and down the back and legs, feet and hands. This in turn had a ripple relaxing and soothing effect on me. Nurses in Lebanon are not aware of the benefits of massage, but by instinct it has been practised sporadically in the NICU because it felt 'intuitively right', rather than because it was based on firm evidence, in terms of its benefit; particularly when the parents' visitation to the NICU is restricted to only a few hours with a hands off policy, the potential benefits of massage might be an important addition and asset to preterm infant care.

On the other hand, as a part-time PhD student in the UK, I am in this particular sense a researcher with an outsider's view. In addition I have worked as a lecturer and clinical preceptor in the nursing program at FHS-UOB for the last 20 years. The etic perspective presents the outsider's view, where the researcher may not necessarily be a member of the culture being studied (Green & Thorogood, 2004; Holloway & Todres, 2006). From an outsider's perspective, the researcher has to maintain the "stranger" element to ask naïve questions. Therefore, I worked hard to see it through the eyes of an "outsider". This

combination of having an insider-emic view and an outsider-etic view, however, is enriching and helpful in understanding and describing the phenomena under study (Green & Thorogood, 2004; Holloway & Todres, 2006) by highlighting the individual professional understanding of the Lebanese NICU nurses in the study. On the other hand, being a health professional and a nurse "insider" with years of experience in the NICU has allowed for a better access and greater understanding of the setting. Due to extensive experience in the area, as a researcher I was able to ask the right questions which were essential for valid data analysis. However, the challenge was to gain analytical distance from the data and to treat the data theoretically.

3.6.8.3 Reflexivity

Reflexivity as a process leading to a set of conclusions echoes reliability/replicability of the study (Seale, 1999; Ritchie & Lewis, 2003). According to Peshkin (1988), the researcher has many selves that he brings to the research setting. The researcher reflexivity in all the steps of data collection and analysis was ensured by the use of a reflexive journal as an audit trail throughout the process. Reflexivity through self-reflection and a reflective journal is a way to show the researcher's social stance and biases that might have influenced interpretation and representation of the HCPs' and parents' experiences or interfered with the research process. Another proposed method of reflexivity was by holding regular monthly meetings with the supervisory team. This research was supervised by three mentors from the UK coming from different research backgrounds. We met on a regular basis and engaged in active discussion relating to study process, methodology, data analysis and synthesis. The meetings were very helpful in raising issues and questioning meanings and interpretations for further reflection on data analysis; this was an important part of the process of reflexivity that enriched the interpretation of the findings of the study. The integrity of the research was reflected in the discussions of details and ethical issues raising the quality of the study.

A challenge I had in terms of my multiple roles and my relationship to the participants was that participants understood the expected nature of the relationship between them and me as a researcher. Concerns about the possibility of the participants changing their responses or behaviour because of my influence as the moderator were also discussed. However, as a researcher and taking the moderator role, I was satisfied and privileged that participants were able to 'open up' and trust me with a good rapport established with all participants in the different FG interviews. Many participants shared their frustrations, concerns and challenges with me. For instance, one nurse was against the intervention by parents. She was very resistant within the FG, however after we finished the FG discussion she approached me to further discuss the topic, defend her position, but also to show me her willingness to apply this intervention if it were to be introduced in the NICU. This demonstrated that some participants need time to establish a rapport. This also raises questions about what the participants are willing to share and with whom. Participants might not share the whole truth at the beginning or they might change their mind depending on the situation and the way the questions are asked, by whom and in which context; whether the statement or action occurred in public or private or in the company of other respondents or only with the researcher (Barbour, 2008). As a result, I became more sensitive to their needs and could identify better with the issues observed during my presence in the NICU and tried to share their side of the story across the remaining FGs.

3.6.8.4 Member checking

To secure the credibility of the data and respondent validation (Creswell, 2009, 2013), the feedback of some participants was sought to confirm the interpretation of the data and the emerging themes as a member checking process. It was undertaken to ensure that the conclusions drawn from the FGs and the observations were similar to what was reported and seen. Member checking was conducted with HCPs from two hospitals to confirm the findings by asking participants to comment on the accuracy of their own verbatim quotes. A summary

of the emergent findings from their FG were presented to them to confirm the perspectives and personal viewpoints represented in the findings and the interpretation of the collected data (Altheide & Johnson, 1994).

This validation method encouraged the involvement of staff in the evaluation and generated more reflexivity to enhance the rigour and the depth of the study and stimulate future recommendations. To this end I gave a presentation at an international conference on November 19, 2016 about "Exploring the cultural, contextual and organizational processes that might affect the implementation of infant massage in the Lebanese NICU environment" within which was discussed the attitudes of HCPs towards future MPM implementation in the NICU in general (Appendix 34). Staff from different hospitals attended the conference and engaged in a dialogue about the topic, adding their point of view and confirming the findings. This method of validation helped me to collect additional data, involve more staff in the evaluation and generate further reflexivity. As for the parents, I refrained from conducting the member check with parents; the topic is very sensitive to them, they are a vulnerable population, and it was difficult to track their addresses as many lived outside the city. Therefore, to ensure their privacy, parents were not contacted outside the hospital setting.

3.7 Summary

Given that the intention of this study was to seek an in-depth understanding of the parents' and HCPs' perceptions and attitudes towards MPM as a potential form of intervention in the NICU, an exploratory qualitative study design informed by ethnography and underpinned by a social constructionism approach was employed to answer the research questions. Adopting a social constructionism position for this study recognises that there are versions of reality socially constructed through the human mind and shared meanings that are context bound. In other words, it accepts that HCPs' and parents' views, perceptions and experiences are socially constructed, subjective, and context dependent.

Using this approach helped to explore intentions for innovation and provide an understanding of future MPM implementation, while comprehending the perceptions and attitudes of all concerned as well as explicating a novel theoretical interpretation of the NPT taking into account the clinical context of the study. Three university hospitals were included; one hospital is in the process of becoming a BFH, one has been BFH and the third one is not BFH. Purposive sampling of nurses, doctors and parents were employed and 13 focus groups were conducted. The researcher was also engaged in informal, non-participant observation in the NICU environment. Data were analysed manually using the Framework Analysis proposed by Ritchie and Spencer, (1994, 2002) and guided by the NPT.

The trustworthiness of the data was established through prolonged engagement, reflexivity, member checking, and triangulation. The data analysis will be presented in the following chapters.

CHAPTER 4 : PARENT FOCUS GROUP FINDINGS

4.1 Introduction

This chapter presents the findings generated from seven focus groups consisting of parents; the term ‘parents’ is used to include all participants in the FGs, including mothers, fathers and other family members. It addresses the first and third research questions, and, as discussed in chapter three, these questions are linked primarily to the theoretical framework of NPT. The latter acted as a basis for making sense of and guiding analytical findings in an empirically grounded way. In the context of this study, NPT has provided a heuristic tool to depict what key participants understand of the intervention and to explore how MPM implementation might work in the NICU. NPT theory suggests four sets of questions which identify possible barriers to successful implementation (May et al., 2015). It also provides possible solutions to improve implementation. As described in chapter three, this qualitative study was aimed at providing insight into the perceptions and attitudes of mothers and HCPs regarding infant MPM as a form of intervention in general, and insight into the cultural, contextual and organizational processes that might inhibit or facilitate its implementation in NICUs in Lebanon.

In this chapter, the analysis begins by describing the findings from the narratives of parents, supported by observational data and field notes. Verbatim responses are used from the participants to report their views and perceptions and to support and validate the reported themes.

4.1.1 Research questions

1- What are the perceptions and attitudes of mothers regarding massage as a culturally acceptable form of intervention to improve the outcome for their stable preterm infants?

3- What are the cultural, contextual and organizational processes that might hinder or facilitate the application of infant massage?

4.2 Findings

4.2.1 Profile of participants

Pseudonyms are used for the participants in reporting all focus groups results. The 22 parents who participated in this study were Lebanese with the majority being mothers (n=13). Details about each participant can be found in table 4.1. The mother's (M) age range was between 20 and 47, among which six reported having normal vaginal delivery (NVD) and seven had C-section. Their preterm infants' ages ranged between 27 and 37 weeks gestation. Eight were first time mothers, three were second time mothers and the remaining two had more than two children. Seven mothers were housewives (HWS), while the remaining six held full time jobs. Their educational level varied, ranging from complementary to university as follows: six were at the university level, recruited mostly from hospital B; three were at the technical level; one at the secondary school level; and three were at the complementary school level. Only five mothers out of the 13 reported expressing their breast milk: one mother out of four from Hospital A (Formerly Baby Friendly Hospital FBFH); two out of seven from Hospital B (Not Baby Friendly Hospital NBFH); and all participants from hospital C (Working to become a Baby Friendly Hospital WBFH), were expressing their breast milk. The details of the hospitals can be found in Table 4.2.

The other people who participated in the study were six fathers (F), one grandmother (GM), one mother-in-law (MIL), and one sister-in-law (SIL). All fathers reported working full time. As for the other family members (GM, SIL and MIL), they were housewives (HWS). Their educational level ranged from elementary to university level as follows: three were at the university level recruited mostly from Hospital B; one was at the technical level (TS), two at the secondary school level, two at the complementary school level (Comp), and one at the elementary school level. All parents reported no previous experience in caring for a

premature baby. The data collection was mainly through FGs and observations in the NICU. The researcher did not receive any individual interview requests.

Table 4.1: Participant profiles

Summary of participant characteristics in the parent focus groups (N=22)

Focus group Pseudonym	Age	Education level	Delivery mode	Children at home + baby in NICU	Occupation	Address	Expressing Breast-milk
Hospital A: FG 7							
Rana (M)	34	TS	NVD	1 in NICU	HWS	Outside Beirut City: OBC	No
Hanan (M)	24	Secondary	NVD	1 in NICU	HWS	OBC	Yes
Nahla (GM)	46	Comp	----	----	HWS	OBC	----
Hospital A: FG 12							
Nadia (M)	24	Comp	C-Section	1+1	HWS	OBC	No
Maria (SIL)	47	Secondary		-----	HWS	OBC	----
Dina (M)	28	BA	C-Section	1 in NICU	Employee	OBC	No
Hospital B: FG 6							
Sally (M)	38	TS	NVD	1 in NICU	HWS	in Beirut City: BC	Yes
Ghassan (F)	47	TS	---	1 in NICU	Private Business	BC	---
Farida (M)	47	BS	C-Section	1+ twins	HWS	OBC	No
Tamer (F)	53	BS	---	1+ twins	Employee	OBC	---
Sima (M)	30	BS	NVD	1	Employee	Suburb of Beirut City: SBC	No
Hospital B: FG 9							
Kamela (M)	38	BA	C-Section	2+twins	Employee	OBC	No
John (F)	46	BS	----	2+twins	Employee	OBC	---
Rima (M)	33	BSN	C-Section	3+twins	Employee	SBC	No

Hospital B: FG 10							
Hanadi (M)	37	TS	C-Section	Twins in NICU	Employee	OBC	No
Souhair (F)	56	BS	----	Twins in NICU	Employee	OBC	---
Dania (M)	20	Comp	C-Section	1+1	HWS	BC	Yes
Charlie (F)	40	Secondary	----	1+1	Employee	BC	---
Hospital C: FG 8							
Enas (M)	33	BA	NVD	1 in NICU	Employee	OBC	Yes
Hani (F)	34	Comp	---	1 in NICU	Employee	OBC	---
Hospital C: FG 11							
Amina (M)	21	Comp	NVD	Twins	HWS	OBC	Yes
Aziza (MIL)	55	Elementary	---	---	HWS	OBC	---

At the time of the study, 16 out of the 22 participants reported living outside Beirut; two reported living in the suburbs of Beirut, and the remaining four in Beirut itself. Recruiting mothers involved a challenging process since most of them lived far from the NICU where their infants were staying and had difficulty in transportation. It also proved difficult to recruit mothers after C-section delivery because of the pain involved and their limited physical activity. However, the recruited sample was diverse in terms of education and age (Table 4.1) and provided appropriate data for comparison to answer the research questions.

Table 4.2: Hospital characteristics

Hospital	Status	Geographic area served	Place	Focus Group
A	FBFH	Low and middle socioeconomic status community, coming mainly from the North and Mount Lebanon regions	OBC	FG 7 (2 M and 1 GM) FG 12 (2 M and 1 SIL)
B	NBFH	Low, middle and high socioeconomic status community, coming mainly from Beirut and Mount Lebanon regions	BC	FG 6 (3 M and 2 F) FG 9 (2 M and 1 F) FG 10 (2 M and 2 F)
C	WBFH	Low and middle socioeconomic status community coming mainly from the suburbs and the South regions	SBC	FG 8 (1 M and 1 F), FG 11 (1 M and 1 MIL)

Furthermore, the MOPH subsidises the private sector so that any Lebanese citizen without medical insurance can receive treatment, often in private hospitals at the expense of the MOPH, since there are not enough beds in the public sector as detailed in chapter one (section 1.6.1).

Verbatim responses were used from the participants to report their views and perceptions and to support and validate the reported themes. The inductive analysis generated a number of themes and subthemes and allowed the emergence of four constructs of meaning in line with the research questions, as shown in Table 4.3, and the NPT, as discussed in chapter three. The presentation of the findings allowed a tracking of the results at each stage of the Framework Analysis. For instance, after the first draft analysis for the parent FGs, the decision was made after in-depth frequent discussions with supervisors to link the themes to the research questions, merging theme 5 “General consideration about the care of infant in NCU as perceived by parents” with theme 3 “Barriers for application of infant massage” and theme 6 “Suggestions for practice” under contextual factors. The decision was made because the themes were similar in terms of exploring the processes that might hinder or facilitate the application of infant massage. It was also agreed to add the issue of “Fear” under different themes but mainly under theme 3; “Barriers to application of infant massage”. Another example, practical factors were added under “Barriers to application of infant massage”. This

merging of themes eliminated redundancies in reporting findings and allowed the data to be compared for commonalities and differences. The researcher compared two categories of results for parents and HCPs. In this chapter, the parental results are presented. Chapter five presents HCP data and chapter six compares the two sets of data.

As mentioned earlier, the NPT was typically used as a heuristic tool to address how massage might work and the observed difficulty in implementing new interventions in clinical settings considering key social and technical contexts (May et al., 2007, 2009). The presentation of the results allows its tracking at each stage of the Framework Analysis. The themes and subthemes are grouped together under four broad categories focusing on the perceptions and attitudes of parents toward infant massage, the perception of the benefits and risks of massage, the perceived facilitators and barriers for engaging in this practice in the NICU, and strategies to promote future implementation from a parental perspective (Table 4.3).

Table 4.3: Research questions and the parent focus group findings

Research question	**Theme**	**Sub-theme**
1. What are the perceptions and attitudes of mothers regarding massage as a culturally acceptable form of intervention to improve the outcomes for their stable preterm infants?	**1.Understanding infant massage** **2. Perception of benefits and risks**	1.1 Familiarity and acceptability 1.2 Lebanese Cultural and intergenerational tradition and historical practice 2.1 Touch as a human need 2.2 Physiological, psychological and relational benefits of infant massage 2.3 Risks, fear and safety issues
3. What are the cultural, contextual and organizational processes that might hinder or facilitate the application of infant massage in NICU?	**3. Perceived barriers for engaging in the practice of infant massage in NICU** **4. Strategies to facilitate future implementation**	3.1 NICU environment as a barrier 3.2 Contextual and organizational barriers 3.3 Practical barriers as perceived by parents 4.1 Parents' commitment and role 4.2 Feasibility of massage application as perceived by parents

Quotations from transcripts are used to demonstrate how parents perceive and understand infant massage, with each focus group identified as FG. Two themes and five subthemes emerged inductively from question 1 and two themes and five subthemes emerged from question 3 as described in Table 4.3.

4.2.2 Theme 1: Understanding infant massage

Participants initially viewed a video on infant massage performed by a nurse on a premature baby in the NICU to prompt discussion. After watching the video, they were asked to reflect on their perceptions and attitudes about the video and the meaning they ascribed to infant massage intervention.

4.2.2.1 Subtheme 1.1 Familiarity and acceptability

Most parents expressed their support of the idea, stating that they liked massage. Many shared their own personal experience of massage. The main subtheme that evolved was "massage as a familiar and acceptable practice". For example, participants reported the following:

> *Hanan: See how happy the baby is [pointing at the screen while watching the film]…These exercises are very good for him. The massage makes him energetic; he is happy and relaxed.*
>
> *Nahla: The baby is relaxed …I used to do these exercises for my children's hands and legs. ….. Massage is very good for the normal [full term] or stable baby …like the way she is massaging the back, in the film, the same thing (FG7)*

When asked about massage intervention, there was agreement across the groups that massage is a good idea theoretically, with perceptions of it being beneficial and relaxing for the baby. Age, gender and education differences between FG participants did not appear to influence this perspective. However, a difference existed in views between older

(Grandmother and Mother-in-Law) and younger participants in terms of the feasibility of application. A notable difference was found between first time mothers and fathers, with the former showing fear because of the small infant weight. However, a change in perspective was echoed later on through the FG discussion, due to the encouragement of other family members (Grand Mother GM, Sister-in-law SIL, Mother-in-law MIL and husband) who were more accepting of the idea. This reveals that within the family relationship women's attitudes were influenced by their husbands' and parents' views in the FG, corroborating the notion that other family members were influential in shaping the views and the mothers' decision-making about their infants. Participants' accounts revealed that the idea of massage is acceptable and that it can be performed, but that its application ranges from easy to difficult.

> *Aziza: (55 yrs.): Yes, it is not difficult at all. Easy to apply ... We have this massage… from a long time ago, I mean, from our grandfather, grandmother and my mother-in-law (FG 11).*
>
> *Hanadi (37 yrs.): I like it, but I feel that this massage thing is a little bit difficult and different from what we know (FG 10)*

Only one mother declared that the massage is the job of the specialist.

> *Rana: Good idea, sure it can be done....very easy....easy, but of course it is the job of the specialist «اهم». (FG 7)*

The video made parents consider their role in the NICU, and they collectively agreed on the importance of massage. It appeared to open new horizons for them to think about a more interactive role with their infants in the NICU; for example:

> *Tamer: I am with the idea of infant massage 100%. It always starts with a few people knowing about it, and after 1 or 2 years, it will become well-known like any intervention ….In my opinion, being in the NICU will help her [the mother] to take care of him [her baby] and how to handle and exercise him, that's it; and this is a key thing. (FG 6)*

Overall though, views were mixed. One participant reported that in the Lebanese culture, massage is commonly used with full term babies and adults, but not with premature babies. After watching the video, he suggested replacing the word massage by another word, something derivative from massage, such as 'caressing/stroking'.

> *John: ... to do massage for my premature baby, maybe the word 'massage', I don't know, I didn't find it applicable because the word 'massage' shocked us; because in our norms and culture, 'massage' is linked with strong pressure on the body for adults. Maybe, if we can find a more gentle term, or even an alternative term ... the word 'massage' is heavy... shocking, ... (FG 9)*

These differences in views could also be related to different demographic characteristics, such as the young age of the mother and the novelty of the experience:

> *Nadia: I am afraid...His weight is low; my first boy's birth weight was 2.5 kg., and I didn't dare get close to him.*
>
> *Maria: ...But this massage is easy to apply, isn't it Nadia? .... Nadia's first baby was born healthy, and after she delivered him here in the hospital, we took care of him and she didn't; she was afraid ...until she was able to take care of him. She is very young, you know? Now, this baby was born premature... she is afraid (FG 12).*

For most parents, massage was perceived as easy and feasible in comparison to more traditional practices, although mothers mainly (12 out of 13) expressed a fear of touching their premature babies. In general, the idea of massage was acceptable and familiar.

4.2.2.2 Subtheme 1.2 Cultural and intergenerational tradition and historical practice

Some parents felt that it was similar to the old or traditional massage performed on full-term babies after having a bath at home; many compared it to physiotherapy as indicated in this discussion.

> *Sima: ...In the villages, the traditional way.... yes, 'sport'*

Tamer: …The old way, it is as if you are doing a sport for him … it is like gymnastics. Only stretching exercises, but not massage; that is a new concept

Sally: …No, I have an idea. The old generation does stretching exercises for the hands and legs of the baby [Swedish-like exercises] but not in the same way that was shown in the film …Yes sport, they do it in a different way. They hold the baby and stretch him like that, you know, the older generation, and they know how to hold the baby. (FG 6)

The older generation such as the grandmother and mother-in law agreed on the familiarity of the practice. One mother-in-law stated that she was accustomed to massaging her children with olive oil after their bath to induce sleep. She showed readiness to do the massage for her granddaughters (twins). She considered such practices as beneficial, well-known and accepted by the older generation, such as rubbing the new born baby with olive oil and doing exercises for the extremities. A similar intervention was noted by a grandmother as illustrated in this example:

Nahla GM: I used to do this massage for my children… after the bath; I used to rub them with … olive oil …. I used to rub all their bodies: their shoulders, hands, back, everything…I used the oil for the first 40 days…. When you put your hands on their bodies, you feel they are very soft. Now, their skin is soft, or this thing helps, I don't know; but the oil helped me while I was massaging them. I didn't call it massage, I was stimulating their blood circulation like this, and I didn't know what it was called (FG 7).

Overall, regarding massage as a cultural and traditional practice, the majority of the parents reported that their mothers used to do oil massage and Swedish-like exercises for them when they were children. However, there was a consensus that it was not performed in the same way as in the video. They distinguished the latter from traditional practice, as the MPM for preterm infants shown to parents in the video was considered somehow different, a new act.

4.2.3 Theme 2 Perception of the benefits and risks of massage

When asked about the benefits and risks of massage, most parents responded directly with little need for probing. Although they easily accepted the physical, psychological and emotional benefits of massage, there was overall concern in all the focus groups about the level of vulnerability of the premature infant. This was a crucial issue that was discussed by all participants and one that could have further implications for implementation.

4.2.3.1 Subtheme 2.1 Touch as a human need

The majority of participants voiced views that massage makes the premature baby comfortable and relaxed and helps its growth. This is demonstrated by the following excerpts of dialogue and level of agreement from the focus groups:

> *Dina: When I put my finger on my baby girl's hand, she catches it and she strains on it, she knows; I mean she feels my presence… The baby will become more attached to you …yes, true …You are her mother … Once you stand beside your baby, she feels your presence, and she feels you more when you are taking care of her… I want to caress her; when I talk to her, she listens to my voice, and I want to stay beside her, close to her…*
>
> *All: [nods with agreement]*
>
> *Maria: …Yes, sure, the baby can feel his mother … I have 3 boys, God bless them, and I feel every one of them … I know who is coming without looking…*
>
> *Nadia: J. my baby also caught my finger once …He feels his mom… yes, sure ... He responds differently when there is somebody other than the mother… (FG 12)*

Aziza (MIL), by instinct, highlighted the importance of the senses of touch and olfaction in the development of early mother-infant interaction. She stated:

> *Aziza: The baby feels that this is his mother; he will have the right feeling. They say: "when the mother puts her baby on her lap, he smells her odor". Because the baby was in his mother's womb, when you put him like this [on his mother's lap], he senses*

that this is his mother, so he relaxes and gets closer to her, and he feels sleepy, isn't that right?... (FG11).

Most participants also showed an understanding of the importance of the parents' touch as a non-verbal communication that will compensate for the premature birth. Kamela highlighted the need of the baby for the womb of the mother.

Rima: ... It [massage] encourages the mother to touch her baby and later this will create a stronger attachment between them

Kamela: ...Suppose the babies were still in our womb till the full 9 months; we would have done this [massage] for them? .... But they were born premature ...so they feel themselves still in the womb when you massage them (FG 9)

Parents articulated different reasons for, and benefits of, touch and the value of being present next to their babies, based on their past experience, understanding of the rationale for touch and their feelings. Thus, their replies were consistent with the common perception of touch as a need and a human right.

4.2.3.2 Subtheme 2.2 Benefits of infant massage

Participants discussed the physiological benefits of massage: as illustrated in the following excerpts, these ranged from stimulating blood circulation to relaxing the baby to relieving pain and colic:

Sally: You feel that the baby is happy ....If the baby is colicky ..., you rub his abdomen like this [making gestures with her hands] or you put him on his abdomen. We rub the abdomen with olive oil. It is known in our culture. It relieves colic…It relaxes.

Sima: Massage also increases flexibility, and it comforts him in case he is stressed; he will be relieved and relaxed. In case he is in pain, it is very important to do a massage because the pain will be eased even if he is crying; the massage will relieve him…. the baby feels safer (FG 6).

Participants also drew upon the role of massage in promoting sleep and in strengthening muscles.

> *Ghassan: Massage makes the baby relaxed; it helps him sleep. Like the Madam said [Pointing at and referring to another participant in the FG], if they do a massage for us old people, all our nerves will be relaxed, we will have the tendency to relax more, to sleep better and then to think better (FG 6)*
>
> *Hanadi: I see that it may give more flexibility to the muscles of his body, to the movements of his hands and legs*
>
> *Charlie: …As Hanadi said, massage gives more flexibility to the baby. I mean, I feel it helps the baby's growth; it strengthens his muscles. If he is rather jerky, it is possible that massage will comfort him (FG 10)*

Only one father saw individualized potential value for massage intervention. He reported that it may promote better relationships between family members:

> *John: It promotes better relationships between family members and family integration… I don't know if we can take [to NICU] their older brother and sister because the parents are still afraid that they will become jealous of each other ... Take this video. If we show it to the older children at home and tell them: "See how the hospital loves your baby brothers. …I am talking about the "psychological aspect;, we should also caress the babies like this because caressing is as necessary as feeding …This helps the older brother and sister overcome jealousy and promotes contact with each other …because as the baby wants to eat, he wants " affection", ….so the baby grows and develops… This is the opposite of family disintegration (FG 9)*

When participants were asked about their perception of benefits other than the physiological for infant massage, discussion revolved around parent–infant attachment and interaction as a need. They discussed the many potential emotional benefits of touch and massage:

Nahla: There will be stronger affection between the mother and the baby. There will be more contact between the mother and the baby. The baby will feel everything; he will feel his mother more…he will feel more secure

Hanan: The baby will improve a lot, he will feel that he is not alone; even the mother will be relieved; she won't feel afraid as much, and this will build a very important relationship between the two (FG 7).

Participants from all focus groups, independent of age, gender and educational background appeared to emphasize the contribution of emotional benefits to building parental confidence in providing care for their baby. One grandmother stated the additional benefit of touch in the flow of milk in breastfeeding.

Aziza: When you put them on your breast, the milk will flow, we say: "The milk, it flows"

Interviewer: emmm

Aziza: The breast will have a very good flow of milk… The affection, the passion, the heart moves; the milk flows better because of the affection

Interviewer [turned to Amina]: You feel it helps

Amina: Yes, sure, the milk will flow better (FG 11).

Furthermore, many parents agreed that culturally and traditionally, olive oil massage for newborns is associated with decreased colic and better sleep, and it contributes to growth "because we say that the olive oil is nourishing". Several participants identified the necessity and benefits of using olive oil during massage. It is linked to their culture, and they perceive it as nourishing and enhancing skin softness. This provided a better understanding of whether the massage intervention had a coherent theoretical basis and if it was used in the Lebanese culture. Key participants were forming an understanding of the detail/form of the intervention and theories of why the intervention could work.

Aziza: We used to use the original olive oil and do a massage for the baby… The baby relaxes and becomes sleepy … It is important for the muscles, the veins and the nerves

because he is small and cannot move; as he was born premature from his mother's womb, so he is still not complete; he wants / needs something…(FG 11)

Overall, in each focus group, there was discussion and examples of the emotional and physiological benefits of massage. Moreover, most of the participants were supportive of infant massage and said that if implemented in the future, they would undertake the procedure. Parents individually and collectively validated its potential physiological, psychological and relational benefits for their baby.

4.2.3.3 Subtheme 2.3 Risks of infant massage and safety issues

Despite their interest in massage application, parents expressed concern about its potential risks and expressed reticence because of this. They appeared to be conscious of the level of vulnerability of their babies. Participants drew upon the following constraints and risks: fear of the small weight and fragility of the baby; the massage technique and application; baby position; timing of massage; type of pressure used and the baby's ability to tolerate it. Such discussions were noted in all FGs and invited debate as revealed by the following discussion:

Rana: Massage is useful, I mean you learn it with practice, but you should pay attention to the technique, such as turning the baby over or something like this.

Hanan: …Yes, I am afraid her weight is too small … I am afraid to do something that might hurt her.

Interviewer: emm… What do you mean by "do something that hurts her"?

Hanan: I mean, if I do something wrong.

Rana: Your mother can help you; she is near you, and may God keep her with you.

Hanan [gasps]: I didn't touch her; I was very much afraid.

Nahla: … I will try at first; I mean I don't know if I am capable of it because my granddaughter is very small… I am afraid to move her hand, as she said also; she is very soft that I am afraid to hurt her or something. Maybe if her weight were a little

greater, it would be more comfortable… Maybe she can't sleep on her tummy for long so that we can do a massage for her or something. I am afraid…

Hanan: Yes, I am afraid; her weight is too small; I am afraid to do something that hurts her…. Now, for example, I fondle her, I try, but I remain afraid; I mean, I am afraid… If I squeeze excessively, something might happen to her… She is very small. … If she becomes 2 kg., maybe, ok (FG 7).

One mother stated that the doctor warned her about touching her babies, as exemplified by Kamela:

Kamela: I don't know, nobody talked to me before about it…The doctors say: "No, nobody should touch the baby now"; but I don't know why and if it is good or bad…maybe because I am afraid … where my babies are concerned, I am a coward. I don't know, maybe another woman has a stronger personality and she isn't afraid (FG 9).

It was also evident that fathers had questions about this novel practice and possible risks despite their acknowledgement of its fundamental importance. They had fear and stress about the condition of their premature babies and consequently the perceived inappropriate application of massage on their premature babies, seen as fragile and delicate, as stated:

John: …. We shouldn't go against resistance if the baby is stiff, so there won't be action against or reaction… I am with the idea because I know after experience that the baby needs his mother's hugs and touch every day till he becomes 7 years of age… So basically the premature baby needs his mother more than the full term baby of course, but I am afraid … (FG 9)

The participants in all FGs discussed the issue of safety. They tended to fear touching the small and fragile premature infant and expressed concern about the baby's safety and the pressure used where infant massage was concerned, as with any neonatal massage intervention that would need to tackle this issue:

Hanan: Now, because my baby girl has breathing trouble, maybe if she slept a while on her abdomen, she might suffocate. For example, massage should not be done for sick babies …We might have complications

Nahla: … Her veins are thin … maybe if you squeeze on a place, without noticing … I don't know (FG 7).

Participants were asked if they found a negative consequence that could possibly result from applying massage. Their accounts depicted concerns that related primarily to the state of the baby, the type of pressure used, future addiction to massage and fear of infection.

Enas: Yes, I am washing my hands in the NICU, but I am cautious, I am afraid that something might happen because the doctor warned us; for example, we are not afraid to touch the baby, but we are always afraid that the baby might catch a virus or something. For example, that day when it was raining, I didn't dare to come over; … I was afraid that he might catch something from my wet clothes (FG 8).

A notable difference was found among two parents who expressed their fears that their infants might get addicted to massage.

Rima: I am afraid that the baby will get used to it; what shall I do? I don't always have time to do this for him; or maybe he gets used to massage, and he will always want massage; even if he gets older and is in good health, he may get used to our doing this massage for him at this specific time always…(FG 9)

Charlie: Now, when the infant grows older… I mean that the person may develop an addiction to massage and will always need somebody to rub his back. Some people, when they get used to this thing, they may become addicted to it; for example, he cannot go to work before someone rubs his muscles. Will it affect him later? (FG 10)

As discussed earlier, one participant highlighted the need for a specialist nurse in applying massage, especially in the presence of monitors:

Rana: Unless there is a specialist, I mean, a specialist who becomes responsible and knows everything. If there is a specialist and it is her job, and she knows how to turn

the baby over and to control the situation, it is better- until machines [monitors] are removed (FG 7)

Several parents had contradictory feelings about massage application in the NICU. Potential risk and fear emerged as the main safety issues discussed since premature babies are small and fragile and parents felt they might not be competent enough to do it. Parents expressed concerns about the safety of its application. Shared negative stories provided some degree of validation for their own perceptions. It appeared that there is innate fear of the potential consequences of massage on the fragile premature infant as reflected in the participants' accounts.

4.2.4 Theme 3: Perceived barriers for engaging in the practice of infant massage in the NICU

Participants were asked to reflect on what might affect their involvement in the care of their infant in the NICU, and if massage were to be implemented in the next six months what key processes would be considered as successful implementation. Participants reflected on the barriers for their involvement in the NICU in general and the possibility of the application of massage in particular.

4.2.4.1 Subtheme 3.1 The NICU environment as a barrier

This subtheme encompasses the level of fear participants experienced in terms of the perceived threat of having a premature baby in the NICU. Most parents had no experience with premature infants and they had concerns around aspects of the NICU (personnel, incubators, monitors and tubes). Many expressed their fear of the hostile, stressful environment of the NICU. It was apparent that some had no preparation for seeing their infants in incubators connected to tubes. They reported their apprehension, reluctance and fear of touching their fragile infant, especially during the early part of the NICU stay; for example:

Sally: When I firstly entered the NICU, I was crying all the time (FG 6)

Participants were asked if they felt welcomed in the NICU and if they felt encouraged to hold and care for their baby. They were also asked if they intended to take part in infant massage practice if such an intervention were made available.

Participants generally felt like outsiders and not part of the care of their infants. Some mothers stated that they did not get enough help and encouragement from nurses to touch or hold their babies. Participants' accounts from the three hospitals suggest that parents were only passively standing beside the incubator to watch their babies.

Farida: …The first day I saw my twins in NICU, I felt like a stranger... Of course, when you take care of your baby, your feelings change and the bond becomes stronger (FG 6)

Observation, field note dated May 9, 2014 in Hospital C, confirms what was mentioned above:

I came at 11am. The visiting hours were over for parents. I saw the last couple leaving the NICU. They were standing alone next to the incubator watching the baby; the father touched the baby via the windows of the incubator and the mom was standing next to him; then they left the room. The mother looked concerned and she seemed anxious.

As one example, a participant from hospital A FBFH reported that she was sitting in the cafeteria most of the time. This reflects the stance of many parents who want to stay near their babies; however, they do not perceive their acceptance to have any role in the NICU.

Rana: … now I feel more secure, but before no, I was sitting here in the cafeteria a lot waiting for my baby (FG 7)

Two participants from Hospital B NBFH stated that they never had the opportunity to hold their baby in the NICU:

Rima: I couldn't carry him, not once (FG 9)

Farida: I haven't touched my premature baby girl at all. They are putting her inside the couveuse (incubator) (FG 6)

Parents expressed commonly shared perceptions and attitudes towards the NICU environment. They appeared worried and awkward in this strange unknown environment. Ultimately, they felt a great stress about their infant's unknown condition. The word fear was repeatedly reported by participants to indicate how they felt with respect to the presence of their baby in the NICU.

4.2.4.2 Subtheme 3.2 Contextual and organizational factors

From the parents' stance, the NICU has many contextual and organizational barriers that limit their participation in daily care and denies them the needed time to discuss their emotions. Staff shortage and attitude, increase in demands and time constraints and restricted visiting hours were major concerns.

The majority of parents claimed that the staff might not allow them to enter the NICU because of other engagements and the nurses' time constraints, especially when there is a sick baby or during rounds. This limitation implies that the NICU's physical structure, staff workload and restricted visiting hours might block their participation in the care in general and the implementation of massage specifically, creating frustration among many participants and inviting lots of debate and discussion.

Hanan: The health team doesn't let us enter when they are changing my baby girl, and when they are doing the rounds; we stay outside (FG 7)

Enas: … The other day we came, but we couldn't enter; there was a sick baby and they were all working with him; I mean we couldn't enter!! (FG 8)

Most parents commented on the restricted visiting hours and contested the rules that prohibit other family members from visiting the NICU. For instance, one couple from hospital C WBFH explained:

Hani: Why should only the mother and the father enter and none of the relatives? …I mean, we live in the South; now when my wife's mother comes or my mother comes and they want to see the baby, why aren't they allowed?

Enas: … This is the first grandchild for my mother here … They didn't allow her to go closer inside. … My brothers are anxious to see the baby, yet they cannot see him. … I took pictures of my baby and sent to them because they cannot enter the NICU…

Hani: …And the same thing goes for my mother; I mean I come from the South… My sister also came from the South … They didn't let her enter; we showed her the pictures … The grandmother and the grandfather should enter… (FG 8)

A similar type of complaint came from participants in hospital B NBFH:

John: But our mentality is wrong: "no, it is a hospital"; they should make us comfortable and we are tired because, "now there is a time for visits, now there is a time for a certain things, now…. I mean, this is an old concept; … let's say intermediate care (IC); we won't compare it with intensive care (Soin: *ICN intensive care for critically ill newborns with complex care needs), I don't know how correct the comparison is; … In the intensive care, you come from 12 noon till 12:30, the mother, the grandmother, the grandfather … want to enter in this half hour. And after this half hour, you should leave till 4 o'clock in the afternoon (FG 9).*

A divergent point in this case was reported by only one mother. The mother showed concern that the presence of parents might affect the work dynamics in the neonatal unit and create insecurity among team workers who may feel supervised or distracted. Restricted hours were regarded as a protective factor as highlighted in the following discussion:

Kamela: But I prefer this system as it is. … The baby is still small and fragile. And now, for example, my sister enters and soon his sister enters, and then my mother enters and then his mother enters; first, the nurses will get tired and they won't concentrate on their work with the babies …They don't only have my babies ; they have lots of babies and they should concentrate on all the babies

John: Of course, but I am against forbidding everybody to enter; the staff should allow the visitors through the glass … The parents should enter and sit, and if they can, they should be allowed to sit with their baby all day (FG 9, Hosp. B)

Most parents perceived hospital rules and settings as limiting and not supportive of the parents' and grandparents' needs, which may have resulted from difficult access to the NICU. For the majority, it is an uncomfortable setting. Parents need encouragement to be involved in the care. Parents also want to visit their babies more often and to stay for a longer period of time in the NICU.

My observational field notes in hospital B dated February 18, 2014 in relation to participation in the daily care confirm that parents are not supported while in the NICU or given the needed time to discuss their emotions or be part of the care.

The NICU was noisy and the lights were on although it was daytime and sunny outside. The sound of the monitors was too loud. There was no policy for noise and light reduction. The tone of voice of the residents and nurses was very high and their conversation was often social and not related to the work they were engaged in. A PN was changing the diaper of an infant and the mom was standing next to her observing her infant and she commented that he did not pass urine. Then the mom said, "Please leave him a bit without the diaper; I want to see his genital area"; Then she commented that his navel [umbilical cord] fell and asked if they had kept it for her. The PN replied "I don't know," and the mom said, "I informed the nurse in charge to keep it for me" and then she commented that maybe her baby had a birthmark. The PN said, "I don't know, maybe". The mom said, "I thought so." Then the mom asked her again, "How much is my baby eating" and the PN replied briefly, "30 cc PO"…. The mom kept staring at her baby through the glass.

At this moment, I had the urge to interfere, to talk to the mother and ask her to touch her baby. However, I refrained from interfering as I was there as a researcher….

4.2.4.3 Subtheme 3.3 Practical barriers perceived or experienced by parents

When parents were asked if they could visit the NICU on a daily basis, they highlighted major challenges among which were transportation, constraints of their occupation and daily tasks, and most often the physical condition of the baby and the mother were cited. Many mothers were concerned about caring for their other children at home as well. These are examples of the practical factors:

Farida: Yes, it is difficult for me to come every day, I have another baby at home (FG 6)

Interviewer: Is there someone helping you at home?

Kamela: My mother comes over, but she doesn't stay all the day… The first 2 children always fight and they are very jealous of each other.

John: We have a helper at home, but we cannot depend on her… And the first 2 children, their ages are 4 and a half, and 2 and a half; it means we now have 4 children…It means "fatigue"; the word "fatigue" is controlling our life. (FG 9)

Hanadi: I delivered twins … and a baby girl who doesn't need NICU care anymore… She is at home. So, coming to NICU every day has become difficult because the responsibility has increased (FG 10)

The occupation of the parents was another practical challenge. One couple pointed out that the time of the visit was linked to the work schedule of the husband that was sometimes unpredictable.

Sally: I cannot visit my baby until Ghassan comes from duty. (FG 6)

John: I am able to visit the NICU, but the problem is the time; I have my own work, I am not an employee. (FG 9)

Charlie: You should estimate; for example, I am in the army and you know the army; today you have a leave, the next day they tell you: "there is duty", or: "there is a change in the duty roster" … (FG 10)

The visiting policy for hospital C is usually one hour in the morning and one hour in the afternoon. Participants in one focus group who had to travel from Akkar (north of Lebanon) to a suburb of Beirut in order to be near their infants pointed out that they could not afford to come on a daily basis because of transportation and financial problems. Economic barriers were mentioned and discussed in only one focus group in hospital C WBFH:

Interviewer: is there any transportation problem? (Silence)... The financial problem will affect; it means you cannot come every day.

Amina: yes, I cannot come every day

Aziza (interrupts): That is the financial problem which has affected our coming to the NICU on a daily basis… That is the transportation to get here, and her husband doesn't work much, you know? … (FG 11)

Many parents had to stay either at their relative's house or rent an apartment beside the hospital in order to visit their baby twice per day. However, despite their commitment to visiting their babies, parents are sometimes not allowed to enter the NICU although visiting hours are open in hospitals A and B only for parents. For instance, parents are not allowed in if there is a procedure or doctors' round or sick baby that the staff is working with.

Charlie: We live in Amcheet [a region outside Beirut]; I mean if Charbel is here, we are here, and when Charbel goes out, we will also stay here for 10 more days in our parents' house…

Souheir: There is a transportation problem …I told you before the roads are difficult, I mean we have to stay now at my sister's house in Aley [a region in the mount of Lebanon which is far 30 min. from Beirut] in order not to go and come back because of a difficulty in transportation… I mean there is a 2 hour distance from Hasbayya to here. (FG 10)

When mothers were asked if they could come every day to the NICU, some responded that having a wound after C-section delivery might limit the daily visit. As mentioned earlier,

more than 50% were C-section deliveries and had difficulties commuting to the hospital every day.

> *Farida: I have just delivered twins and I am bothered by the wound [C-section pain], and I haven't adapted to the situation; I mean the sleepless nights and so on. I surely would like to be here every day, but I am not able to do that (FG 6).*

I reflected in my field note on the day of the FG with Farida:

Reflective journal
One of the mothers was tired due to being post C-section. She got emotional and cried. I gave her support and more time to self-express, and what was nice was that other mothers in the same FG supported her as well. She started to ask many questions in relation to her babies …

The physical condition of the baby may also limit the implementation of massage. Mothers might refuse to participate and may worry and be afraid about their infant's condition.

> *Rana: … But now I cannot because my baby is connected to machines, you know? Because he is already, I told you the reason: his heart. When everything is removed [tubes and monitors] from him, I will feel secure and will be able to turn him (FG 7).*

The participants' focus was mainly on individual barriers, such as feeling uncomfortable after a C-section delivery. Moreover, the practical issues of transportation and living far from the NICU setting were common concerns across FGs, especially for mothers who depended completely on their husbands for transportation. Having other children at home might also present a barrier for some parents. In addition, at the hospital level, the majority of the participants argued that contextual and organizational issues such as the NICU's physical structure, the nurses' time constraints and the restricted visiting hours might also block infant massage implementation. Only one participant showed reluctance to the idea of changing the

current NICU's visiting hours, possibly out of fear that allowing visitors might distract the nurses from caring for her infants.

4.2.5 Theme 4: Strategies to facilitate future implementation

When participants were asked about what would facilitate future massage intervention, the majority raised the issue of the parents' commitment and readiness to modify their schedules, as well as the need for staff assistance, encouragement and gradual implementation as key issues.

4.2.5.1 Subtheme 4.1 Parents' commitment and role in NICU

Parents were asked if they would be able to assist in the care of their infants in the NICU, such as changing the baby's diaper and feeding him/her if asked. The majority of parents felt the idea of being close to the baby and taking part in his daily care would help them overcome their fears and nervousness. For example:

> *Kamela: Sure, because, like they say [referring to a Lebanese proverb], if you see the baby every day or you do this thing -- massage-- for him every day, it will become like a habit. I mean, you will get used to it and you will feel comfortable and not nervous, or afraid, or even alone and confused… It mean, it will affect you positively at the end ….Better; if he is calm, I will be calm; if I am calm, he will be calm for sure (FG 9)*

Several participants showed willingness to participate in massage and expressed commitment to it. Motivated parents supported the idea of implementation and expressed their willingness to participate in the care of their infant in the NICU.

> *Hanadi: yes, I like to work on this subject, to learn to do massage as a start. (FG 10)*

From the same perspective, Charlie stated that his presence next to his baby was fundamental and even more feasible than the mother's presence. He showed enthusiasm and expressed his readiness to come to the NICU and massage his baby.

> *Charlie: On the contrary, I find that the father's time is better than the mother's time... I can come while my wife is doing something else at home, or is with the children, especially that they will become two. I personally prefer to massage the baby myself; I don't know, I feel more comfortable …My wife would like to, of course, but I am like*

that… I am afraid for my children; I mean she is even afraid…. Yes, I like to help in the upbringing and nurturing of my babies (FG10).

In general, fathers were very concerned about their infants' wellbeing and keen to participate in the care of their infants (refer to field note reflection). They found massage to be a worthwhile intervention for them and their babies. They agreed that infant massage should be introduced and be part of their daily visits to the NICU.

John: … I talk to him because I feel maybe that he needs to hear my voice. I mean, even if the nurse responsible for him in the NICU is very close to him, it isn't like the feel of his own biological mother and father, whom he resembles genetically (FG 9).

My field note reflection at that time:

Reflective journal

I find it strange that fathers were eager to be part of the FG and showed interest in applying massage. So I see myself as stereotyping the role of fathers before listening to them, maybe because I did not expect this attitude within the Lebanese cultural context.

In contrast, few parents had a different perspective since their past experience as parents was seen as impacting their decision to participate in the care; for instance:

Kamela: I don't know what to answer because they [the twins] scare me and also the older ones; not only with the premature twins, but also with the normal ones; the first also [the eldest]. I don't know; although I love children very much, I carry them and everything, but with my children, I don't know why; maybe because my eldest daughter used to aspirate with the milk bottle and regurgitate all the time and she has remained like that, so I am still afraid... I am worried how I should feed them and take care of them. (FG 9)

Some parents showed readiness to carry out massage in the NICU; others were reluctant. The impact of past personal experience, individual attitude, and cultural perception seems to

influence their decision and commitment to future massage practice despite the perceived potential value of massage.

4.2.5.2 Subtheme 4.2 Feasibility of massage application in NICU as perceived by parents

When participants were asked about the feasibility of massage application in the NICU, the majority voiced the need for its gradual implementation in the NICU, although they believed in the value of their involvement with it. Several participants showed an interest to apply massage. However, they reported the need for gradual application and for training with close monitoring and assistance by HCPs throughout the process. They needed reassurance that they would do no harm. Most participants suggested having the massage application done on their babies or a doll at first as a first demonstration by the nurse or specialist, and then they could do several supervised applications on their babies.

Interviewer: You mean you should come several times to see them first?

Hanan: True we need several demonstrations first…. It is even a psychological thing; you need to be encouraged; for example I have already carried my daughter twice …We might need around 10 times to become able to do the massage alone. … I need somebody beside me; I mean I don't dare to be alone…Yes, we should be prepared for it gradually…

Rana: Yes, it needs training, a little on the doll first. (FG 7)

Rima: I need the nurses' assistance and presence by me at the beginning. The fact that I can't open the incubator is a barrier. …We just need more time to learn the technique and then apply it. (FG 9)

Another recurrent issue that was raised among parents was the need for a general parental training program on premature babies' needs and infant care.

Souheir: Yes, they [nurses, staff…] should call the mother … to teach her how to bathe the baby, how to feed…, what type of milk is needed, etc… (FG 10)

From the parents' perspectives, the need for private space for parents and a general training program were highlighted; and if massage was to be introduced, the need for intensive training.

> *Hanan: You should learn it here in the hospital, because if there is something wrong or something happens, you feel insecure till you will have enough experience … If I see somebody doing it 100 times, it is not like doing it once…. Yes, for example, when my baby's breath gets interrupted, they help me directly. They always show me how to carry her so that nothing happens to her …They teach us these things the last week before we take the baby; they teach us baby bath and all of these things … (FG 7).*

Parents reported the need for training and continuous assistance from nurses in order for the mother to become more confident and apply the massage. Parents tried to figure out the best time to visit the NICU for the application of the massage. This issue was discussed actively in most FGs, and participants suggested solutions in order to facilitate entry to the NICU. For example:

> *Charlie: The visits are usually open for parents only. Sunday, the holiday, is the calmest day… It is stricter on the other days …Once on a Sunday, my daughter was allowed to visit and she saw her brother: other than that she couldn't go in.*
>
> *Souheir: …We used to take into account that it is crowded in the morning, so we came in the afternoon; we found that the time is preferable for them in the afternoon because they are busy in the morning; that's why we prefer to come in the afternoon. (FG 10)*

Participants' accounts highlighted Lebanese cultural norms by which family members care about each other and feel concerned. Ultimately, participants noted the desire of the grandparents and extended family members to visit the infant in the NICU and to be part of the experience. Strict visiting rules in the NICU were seen as a barrier by many parents and grandparents as illustrated in the following example:

Nahla (GM): …The nurses and doctors are very good, but because I am not the baby's mother, they don't let me enter; I mean, because they fear infection. (FG 7)

When asked about space availability in the NICU to apply massage, most participants did not have any problem with it as long as they were not bothering the work in the NICU. For example:

Rana: No problem, you should only have space so that you don't feel troubled (FG 7)

One father, who complained about the space available to parents, requested providing a "special room", as illustrated in the following example:

Souheir: I have found… that the parents need to sit with their baby in the NICU more because he is their own flesh and blood; now you enter for a little while, and when he cries and you want to leave, you feel that your soul has stayed inside. There should be… a "special room"… a special location for this matter, not that I enter the NICU and see my baby in this situation. I want to enter and be able to touch him, carry him and put him in a certain place inside a special section; I mean, to touch and massage, etc… (FG 10)

Participants had similar views about the extent to which the nurses' approach was caring in the different hospitals; as an exception within Hospital C, only one participant, Amina, reported not being encouraged nor supported by any of the nurses to hold or touch her babies (refer to page 28). This was mainly related to the staff's attitude and psychological support. When asked about the relationship between them and the nursing staff, the majority reported that it was a good relationship. In fact, there was general agreement that they respect and trust the nursing team, and they have built a good relationship with them. For example:

Souheir: We have been well treated in the NICU; I mean the staff and nurses treated us with love …And after that, we became friends with them, friends on the phone when we call them (FG 10).

Some participants from hospitals A and B described how they built their trust gradually by observing how the nurses dealt with their babies in several encounters, as illustrated in the following discussion:

> *Tamer: The department here is very good ….so friendly and professional. Now, it is their right to tell us sometimes:" Sorry, the doctors are inside". You should understand them sometimes:" Wait for us a little while."*
>
> *Farida: … They take care of the babies; you feel as if you are at home, they caress the babies and they kiss them*
>
> *Sally: …The staff nurse was singing … last time, ha-ha… All are good… I have memorized their names…The Head Nurse is also good; all of them. And when you ask them a certain question, they answer you and they say: "It is better that you ask the doctor", you know? I mean, they tell you to do what is best ….Every time I leave, I tell them to take care of my baby, and they answer: "Don't worry, this is our child" (FG 6)*

There was one participant as an exception within hospital C; Amina identified some barriers in relation to the nurses' attitudes as illustrated in this example:

> *Amina: No, nobody told me to hold or touch them. … I only stand beside the incubator. Nobody encourages me to touch or hold my babies. … I would love to touch them but they are always closing the incubator on them ….*
>
> *Aziza: Tell them (the nurses) that you want to carry them (the twins) a little*
>
> *Interviewer: Why didn't you ask them?*
>
> *Amina: I do not ask because I feel I am taking the nurses' time…Yes, they tell us that the visiting time is over; sometimes we are obliged to come late outside visiting hours because of the traffic problem (FG 11)*

According to my observational field notes in hospital C, the nurses did not encourage parents to ask questions and any teaching was done just before discharge. The only interaction with

parents I observed was for milk expression and breastfeeding. This was also confirmed by my observation notes and will be further explained in the HCPs analysis chapter.

From my observation field note (*July 4, 2014 hospital C)*

Today the HN told me that Amina, the mother of the twin girls, does not often come to visit her twins and today … she came to the FG. She added that she will tell her to come at 10:00 to teach her how to express her milk. The mother was bringing some breast milk for her babies but had stopped in the last 2 days. The babies were given formula instead…

Visiting hours are between 10-11 am and 4-5pm only. Also, only father and mother were allowed in the NICU. The mother can come outside visiting hours upon agreement with the staff to breastfeed. ….A chair is put next to the incubator and the baby is wrapped and given to her for breastfeeding. This was the only contact between the mother and her baby. Nurses worked silently and in harmony. They had good relation with each other…

In sum, the participants' responses can be divided into two categories. Some were keen to participate and showed willingness to put time and effort into coming on a daily basis to apply massage. Others were still reluctant; they were influenced by previous negative personal experience and cultural, contextual and practical issues that seemed to affect their decision and commitment for future massage implementation. The nature and form of this complex intervention – whether concerns relating to the condition and position of the baby during massage, or the visiting hours and nurses' availability for support – in addition to the nurses' time constraint, workload, commitment and openness to innovation appeared to have potential to limit implementation of MPM by parents. On the other hand, staff availability, encouraging attitude, training and gradual application, and supervision and close monitoring from the nurses appeared to play a significant role in the likely success of future implementation.

4.3 Summary

This chapter addressed the findings of the first phase of the study and answered research questions 1 and 3 from the parent focus groups, observational data and field notes. The focus group findings clarified the perceptions and attitudes of parents towards infant massage as a culturally acceptable form of intervention; and explained the contextual and organizational processes that might hinder or facilitate its application in the NICU. There was enthusiasm for massage as a culturally acceptable practice by almost all participants. Most parents individually and collectively construed potential physiological and emotional benefits of massage and considered touch as a vital intervention and a need that could not be ignored. However, due to the complexity of the intervention, there was controversy as parents felt that they did not want to jeopardize the health condition of the baby; they expressed their fears and worries about the health of their premature infant and the potential risks of massage. This answered the first research question and enabled further understanding of the perceived barriers and facilitators for engaging in the practice of infant massage in the NICU.

The findings show that parent participation in the care of their infants in general is still at an embryonic stage in the three neonatal units. Parents were aware that having their infant admitted to the NICU is in itself a very stressful event. They highlighted their worries over the wellbeing of their infant and fears over their baby's life as they were faced with an unfamiliar environment. Parents revealed their total dependence on HCPs for the care of their infant. However, they reported an interest in implementing massage because of its importance as a need and a human right. They recognized its mutual benefit for them and their babies. Parental views provided insight into significant strategies and critical barriers that need to be considered to enhance their future massage implementation. These relate mainly to individual and practical barriers, such as: the health condition of the baby and the mother, having other children at home, transportation and financial constraints; and also relative to the NICU context and organizational barriers, such as restricted visiting hours in the NICU and staff workload. The majority of parents felt that the physical structure of the NICU and its

environment did not encourage parents to stay with their infants. On the other hand, the parents highlighted facilitators for future implementation, such as parental commitment and the need to be encouraged and continuously supported by nurses and HCPs. In addition, parents highlighted the need for gradual implementation of massage and early discharge teaching. This answered the third research question from the parents' perspective (RQ3). To complete the picture, the next chapter presents findings from the HCPs' perspectives.

CHAPTER 5 : HCP FOCUS GROUP FINDINGS

5.1 Introduction

This chapter presents the findings from the focus group interviews with HCPs supported by observational data and field notes. It addresses research questions 2 and 3 from the HCPs' perspective.

5.1.1 Research questions

2. What are the perceptions and attitudes of HCPs concerning massage as a potential intervention provided by mothers in the NICU?

3. What are the cultural, contextual and organizational processes that might hinder or facilitate the application of infant massage in the NICU context?

5.2 Findings

5.2.1 Profile of the participants

Pseudonyms were used for the participants to protect their anonymity. All Lebanese HCPs who were approached for the study agreed to participate. For the participants' profiles see Table 5.1.

Table 5.1: Characteristics of Participants (N=38)

Hospital/ Focus Group/ Participants' age range	**Education level / Position**
Hospital A / FG 1 4 Females Mean Age = 41	1 Head Nurse HN, BSN, diploma in child care 2 RN BSN, diploma in child care 1 MD-deputy chief department, Paediatrician (Consultant)
Hospital A / FG 13 7 Females Mean Age = 36	2 Practical nurses LPN (one year diploma program) 1 Junior specialist R1 1 BSN student 1RN BSN 1BSN, HN 1MD- deputy chief department, Paediatrician (Consultant)
Hospital B / FG 2 8 Females 1Male Mean Age = 35	1 Head Nurse HN, BSN 5 RN BSN 1 Practical Nurse PN 1 Junior specialist R2 1 MD-Neonatologist, Consultant
Hospital B / FG 3 4 Females 1 Male Mean Age = 35.5	1 RN BSN 1 RN Technical degree 1 Junior specialist R3 1 Junior specialist R1 1 Med III
Hospital C / FG 4 7 Females 2 Males Mean Age = 31.5	1 RN BSN, Supervisor NICU 1 RN BSN 1 RN BSN-MSN nursing instructor 2 Technical nursing students 2 Neonatologists-Paediatric, Consultants 2 Junior specialists R4
Hospital C / FG 5 4 Females Mean Age = 33	1 RN BSN 2 RN technical degree 1 Junior specialist R4

The sample was diverse in terms of education and age (Table 5.1). Participants were purposively sampled from three university hospitals in an effort to provide sufficient variation in setting to allow for a meaningful comparison in answering the research questions. One hospital is WBFH, another is a FBFH and the third one is an NBFH (Table 5.2).

Table 5.2: ***Hospital Characteristics***

Hospital FG	**Status**	**Geographic area served**	**Place**	**Unit/beds; Census/month Visiting policy**
Hospital A FG 1 & 13	FBFH	Low and middle socioeconomic status community, coming mainly from the North and Mount Lebanon regions	OBC	10 beds (6 IC and 4 ICN) 7-8 admissions/month Open door policy outside rounds and procedures; for parents only
Hospital B FG 2 & 3	NBFH	Low, middle and high socioeconomic status community, coming from all regions in Lebanon	BC	11 beds (7 IC and 4 ICN) 15 admissions/month Open door policy outside rounds and procedures; for parents only
Hospital C FG 4 & 5	WBFH	Low and middle socioeconomic status community, coming mainly from the suburbs of Beirut and the South regions	SBC	12 beds (7 IC and 5 ICN) 24 admissions/month Visiting hours: 10-11am and 4-5 pm for parents only or by appointment for breastfeeding mothers.

The first two HCP focus group accounts were analysed using a Framework Analysis process (Ritchie & Spencer, 1994, 2002) and analysed separately from the parent FGs by which emerging issues raised by the participants' views, attitudes and experiences led to the construction of the thematic framework subsequently applied to the rest of the transcripts. Then the analysis of the remaining parent and HCP focus groups took place simultaneously using Framework Analysis, but the results were presented separately. This provided a generic account of how parents and HCPs construct and perceive infant massage within the NICU context. Although the topic guide and research questions were guided by the NPT as a sensitizing framework, the themes and subthemes were developed after carefully listening to the audiotaped FGs, reading the transcripts in Arabic, and becoming immersed and familiar with the data. This helped introduce and capture the meaning conveyed in the participants' accounts from the different hospitals. In keeping with the qualitative nature of the study, two levels of reading were done, as advocated by Mason (2002), both interpretive and reflexive, to search for meaning and make comparisons within and between the hospitals. In addition, the coding and analysis of the observation data and field notes were incorporated where appropriate to make sense of the findings (chapter 3, section 3.6.7.2). The presentation of the findings allowed for the tracking of the results at each stage of the Framework Analysis as

described in chapter four (section 4.2). For instance, some codes were collapsed and condensed as a result of patterns, similarities and relationships within and across the FGs as well as the identification of both similar and divergent accounts being noted. Some codes were abandoned or merged under different key themes and subthemes, and some codes were created as new themes emerged to achieve a more interpretive level of understanding.

Two themes were derived inductively from the analysis to answer question two: 1) understanding infant massage and 2) the perception of benefits and risks. Similarly, two themes emerged from the analysis to answer question three: 3) perceived barriers to engaging in the practice of infant massage in the NICU and 4) strategies to facilitate future implementation (Table 5.3). Verbatim quotations demonstrate the perceptions and attitudes of the HCPs regarding infant massage as an intervention in general, and the cultural, contextual and organizational processes that might limit or facilitate its implementation in NICUs in Lebanon. They also illustrate what was said and how HCPs perceive and understand infant massage and demonstrate how interactions evolved within a FG to support and validate the reported themes in addition to observational data and field notes. However, in order to not lose valuable contextual meaning of the account, long quotes are sometimes used. Provision of sufficiently rich and thick descriptions is important to allow readers to make important judgements regarding trustworthiness (Lincoln & Guba, 1989). Table 5.3 illustrates the themes, subthemes and sub-subthemes from the data and how these relate to the research questions.

Table 5.3: Research questions and the HCP focus group findings

Research question	Theme	Sub-theme
What are the perceptions and attitudes of HCPs concerning massage as a potential intervention provided by mothers?	**1.Understanding infant massage** **2. Perception of benefits and risks**	1.1.Familiarity and acceptability 1.2.Lebanese cultural and intergenerational practice 2.1 Touch as a human need 2.2 Physiological, psychological and emotional benefits of massage (infant, mother, nurse, hospital) 2.3 Risks, safety issues, and understanding how it might be implemented
What are the cultural, contextual and organizational processes that might hinder or facilitate the application of infant massage in the NICU?	**3. Perceived barriers for engaging in the practice of infant massage in the NICU** **4. Strategies to facilitate future implementation**	3.1 Staff perception of parents' fear of caring for their infant in NICU 3.2 Staff workload and time constraints 3.3 Staff attitude to parents 3.4 Entry to the NICU and space availability 3.5 Staff perception of parents' readiness for implementation 4.1 Contextual factors: 4.1.1 Preparation of staff and parents 4.1.2 Parental access to the NICU 4.2 Organizational factors: 4.2.1 Commitment to practice 4.2.2 Staff shared decision making 4.2.3 Establishing protocol and guidelines

5.2.2 Theme 1 Understanding infant massage

Participants were initially introduced to the same video presented to parents (described in chapter three) (Appendix 9) as an operational definition of MPM, and to stimulate an initial discussion to reflect on their thoughts, perceptions and attitudes towards infant massage. It was important to situate infant massage within the NICU context in order to explore the meaning HCPs ascribed to massage as a new intervention in the NICU.

5.2.2.1 Subtheme 1.1 Familiarity and acceptability

After watching the video, 34 out of 38 participants reported that massage is acceptable and easy to implement. Most of the HCPs supported it and stated that it was a "good idea and important act". Many HCPs reflected on the biophysical benefits attributed to oil massage as

applied within the NICU norms. The main subtheme that evolved was a "familiar and acceptable practice".

> *Maria: Beautiful and nice …It is not a strange idea; we do these things, maybe not for that long [time wise]. … We usually do massage like movements with crème [oil] after the bath and even on every "tourneh" [round on the infant every 3 hours].*
>
> *Roula: Yes we do the same thing more or less. The film we watched was very nice [Mahdoum]. I loved it. …We hydrate the skin if it is dry, and you feel the infant is more comfortable after doing an oil massage (FG1, Hosp. A)*

In hospital A, FBFH, the nurses compared the massage in the film to the oil application practised in their NICU. They valued the application of oil as part of the essential care carried out in their unit.

Another example, from Hospital B, NBFH, tackled the intervention from a different perspective and compared it to what they do as "caressing" or rubbing the infant's head. In fact, some nurses compared massage to something they do spontaneously, though sporadically, depending on their time as reported in the following discussion:

> *May: Sometimes, if we have time, yes, why not. I am doing it even without it being implemented; I am doing it alone…*
>
> *Doris: You do these things unconsciously, yes. It is not that I am obliged to do this…Jade [referring to a nurse in the NICU] keeps on caressing the infants without thinking of it. … If the infant wakes up and starts to cry, you enter and rub his head, his hair; you do this without thinking. But sometimes I think: ouf! These things use up my time.*
>
> *May: Yes, some of them don't like to do it; it depends on the nurse's character. (FG 3, Hosp. B)*

Although massage was perceived as having emotional benefits, not all nurses were willing to give up their time. Some nurses reported that they were forced to disregard the infants' emotional needs because of care routines and time constraints. Therefore, the nurse's

attitude and time factor might play an important role in choosing whether or not to apply the intervention especially in hospital B.

In hospital C, WBFH, the nurses agreed that massage was a familiar practice. They compared the technique to what they did during a routine infant sponge bath and expressed how it might work.

Sanaa: it is easy and it can be applied

Reem: and it is beautiful … (FG 5, Hosp. C)

Zeinab: We do this with the bath…Almost like in the film, with circular movements; … for the shoulders from inside to outside. This is our bath technique; we use the sponge with the same technique and circular movements. (FG4, Hosp. C)

In contrast, however, three junior specialists from hospitals A and B stated that the act was unfamiliar and seemed surprised and sceptical about the idea of doing massage for infants in the NICU. Generally, nurses were more in favour of the concept and one nurse highlighted that parents would be pleased with the idea as illustrated in these examples:

Zeina (junior specialist): What do you mean by massage? It means physiotherapy? … I find it a little strange, I don't know why. I feel it is strange for the infant (FG13, Hosp. A)

Carina (R3): In a hospital setting, I've never heard of massage (FG 2, Hosp. B).

Yasmine (junior specialist): What they have done in the film is like "physiotherapy"… But no, we do not do massage for them [A couple of participants agreed by nodding their heads].

May (nurse): if you tell the parents, they would be happy with the idea… they would like it a lot [بكيفو]. (FG 3, Hosp. B)

Although there was some variation in terms of the level of awareness of massage intervention between participants within and across the FGs, HCPs distinguished this infant massage in the NICU from their actual practice, such as oil application. Some compared it to an oil massage or a sponge bath, others to caressing by rubbing the infant's head. Massage as

an application was familiar to and acceptable in general by HCPs, primarily by hospital A staff, as they tried to identify its value, benefits and importance, and to anticipate the relationship between massage application in the observed video and how massage might be implemented in practice.

5.2.2.2 Subtheme 1.2 Cultural and intergenerational tradition and historical practice

Twenty out of the 25 nurses talked enthusiastically about the idea of massage and spontaneously shared their stories. They reported that massage is part of the Lebanese culture, but not necessarily as represented in the video, yet something close such as oil application and doing Swedish-like exercises for the extremities after a bath for full-term infants. They also said massage was sometimes used for colic relief as part of cultural tradition. In all FGs the participants individually and collectively shared an array of stories on massage. For example:

Nada: For most of our kids we did massage with olive oil

Tania: With olive oil after a bath.

Hani [consultant]: Yes, but for the full-term not for the preterm infant.

Jade: When they say that the baby has gas, they prescribe olive oil; you rub the body.

Carina: …at home, we rub him with oil, either with Johnson's or with olive oil; it is not a new idea or new concept (FG2, Hosp. B)

Farah: at home, we do massage for our children [born full-term]; they feel happy …relaxed. (FG 5, Hosp. C)

Many participants compared infant massage to intergenerational traditional practices.

Doris: Our parents used to do massage for us. (FG 3, Hosp. B)

Lina: The parents were used to doing massage for new-borns a long time ago in the villages… They used to flex and extend the arms …and it is close to the film … My mother used to do this for me. Maybe now it is done in a more scientific way…

Fida: I used to do it for my sisters' and brothers' babies with "baby oil" and taught my sisters how to do it for their babies. (FG 13, Hosp. A)

There was clear agreement that massage is a cultural practice for full-term babies, and almost all of the participants agreed that the baby relaxes afterwards.

5.2.3 Theme 2 Perception of the benefits and risks of massage

This theme illustrates the HCPs' perceptions of the physiological, psychological and emotional benefits of massage, in addition to the related risks. It includes three subthemes concerned with touch as a human need; understanding the value, benefits and importance of massage in the NICU; and the risks in applying infant massage, safety issues, and understanding how it might be implemented.

5.2.3.1 Subtheme 2.1 Touch as a human need

Participants from all six focus groups highlighted the infants' need to be touched. They talked about massage as a human need which provides emotional support to the infant to feel that he is in contact with human beings. For instance, several nurses shared their own feelings and reported that they were able to tell when the infant was in need of touch and massage, as illustrated in the following discussion:

Jade: This massage gives the infant emotional support; I feel sometimes that the infant needs it. Sometimes I feel he is agitated, unhappy…; he doesn't know what he wants, he is stressed; I become confused, what shall I do? … I feel I want to carry him and do a massage for him.

Mary: It is the fact that he is spending time in the incubator (couveuse); you later feel that these infants are depressed; they can't tolerate themselves [fussy]; so I think that this act (massage) makes them more comfortable

Tania: You put your hand under them, on their abdomen, like this [with hands demonstration], and then you caress them; they will become calm. (FG2, Hosp. B)

Another example emphasizes the infant's need for touch and massage to counter his isolation:

Amal: I felt there is skin to skin contact which the infant in the NICU lacks; I mean he is isolated. From a human perspective, massage is very nice (FG 4, Hosp. C).

Maria: A positive human touch, and not only painful procedures (FG1, Hosp. A)

Many participants across and within FGs agreed that massage is a fundamental human need, comforting the infant and countering isolation.

5.2.3.2 Subtheme 2.2 Physiological, psychological and emotional benefits of infant massage

Almost all HCPs across FGs identified the physiological, psychological and emotional benefits of massage for the infant and the mother. The majority agreed that massage enhances circulation and relaxes, soothes and helps the infant in growth and sleep. These benefits were extrapolated mainly from their cultural beliefs about massage and what they knew and experienced on full-term babies and the oil application done on infants in the NICU. The group tended to focus on the emotional benefits of massage in promoting bonding and enhancing parent-infant interaction. However, the more educated and experienced staff appeared to be more aware of these benefits. For example:

Zeina [junior specialist]: Massage makes the relationship between the mother and the infant closer, and the infant becomes more stimulated; we are getting him closer to his mother's environment. (FG 13, Hosp. A)

Nada [HN]: Massage improves his blood circulation … He sleeps 3-4 hours after a massage. ...You will be hydrating the skin because the infant is in the incubator; his skin is dry (FG 2, Hosp. B)

Rabih [consultant]: The benefits are the relaxation for both the mother and the infant (FG 4, Hosp. C)

Another example from Hospital C emphasized other perceptions about the benefits of massage, such as enhancing the immune system and improving the metabolism and circulation, in addition to other emotional benefits for both term and preterm babies.

Reem: … The child's immune system improves … the digestive system with the metabolism; the infant won't have abdominal distension, and it is also relaxation for the infant in general… Also, you are showing him tender and care; the infant will surely feel it and he needs it. Massage will improve the circulation … (FG 5, Hosp. C)

In addition, five participants from Hospital B (NBFH) and C (WBFH) perceived massage as a means to help decrease the mothers' stress and depression and as a facilitator for breastfeeding, as well as to acknowledging the role of the mother as the primary caregiver. Several HCPs highlighted additional benefits in preparing mothers for discharge and countering forced separation, as illustrated in the following interactions:

*Bramia: The mother feels happy. He is her "BABY" and she is taking care of him….*The *mother won't be depressed.*

Liz: She is doing something for him.

Hani: And you feel that the infant has decreased the mother's tension because the mothers are traumatized and usually have stress … This will facilitate breastfeeding …She will be prepared when her infant is discharged.

[Lima agreed with Hani by saying eh and nodding her head]. (FG 2, Hosp. B)

Nour: The mother gets used to taking care of her infant, especially if the infant is small and people are afraid of him.

Amal: It means as if we trained her for post discharge.

Rabih [consultant]: When the mother sees that she is allowed to be in contact with her infant and to do a specific intervention for him, it means that his case is not that difficult, and this thing eases her stress.

Zeinab: …She also needs to touch him.

Amal [RN and nursing instructor]: …It improves breastfeeding. (FG 4, Hosp. C)

Many participants from hospitals A and B seemed to appreciate the positive effect of touch and massage on the staff and the infant. Nurses reported feeling better connected to the infant

and inducing a positive feeling. Four nurses in hospitals A and B signposted the emotional benefits to the nurse as they reported:

May: Yes, I feel happy; it is a nice feeling, as if I am a mother… (FG 3, Hosp. B)

Caren: I feel happy as the NICU and the babies are part of me; ….this makes me feel very close to them. (FG 13, Hosp. A)

Maria: the infant is exposed to painful stimuli from the start, so massage makes him feel comfortable and the nurse feels happy when she provides this care for him, so I say to myself:" Now I have done everything for him, I feel I provided all the care needed " (FG 1, Hosp. A)

Nurses in hospital A, FBFH, considered massage as a means of communication and a caring approach that should be routinely introduced as part of the care provided:

Maria: If I talk to the infant, maybe he won't understand or listen, so he doesn't have anything except this touch, which is the communication between the infant and me …so massage is included in all the care the nurse provides for the infant.

Roula: …There will be a more caring approach when you do it. (FG 1, Hosp. A)

Parental trust in the nursing staff, as another advantage derived from massage application, was raised among nurses in hospital A, as illustrated by the following:

Fida: …The parents, when they are beside me and see me doing massage with oil to their infant, they feel more trust in me and they feel that this nurse is taking good care of their infant. (FG 1, Hosp. A)

In summation, HCPs, individually and collectively, perceived potential value in the implementation of massage on the infant, the mother and the nurse. The majority of the participants agreed that the emotional benefits could be appreciated by the mother/parent and the infant as well as the nurse. Participants, primarily in hospital A, considered that massage is likely to increase the parents' confidence in caring for their infant, promote a nurse-infant relationship, empower nurses, and more satisfied with the care they provide.

5.2.3.3 Subtheme 2.3 Risks of infant massage, safety issues, and understanding how it might be carried out

Despite their interest in massage implementation, some HCPs voiced concerns about the level of vulnerability of the babies. They talked about the constraints and risks related to the massage technique and its application by parents. The infant's health condition, timing of massage, hygiene, temperature of the infant, type of pressure used and the infant's ability to tolerate it were the main issues that invited discussion and debate among participants. The issue of safety prevailed and was discussed actively among participants in all FGs. HCPs tried both collectively and individually to understand how this intervention might work and their specific tasks and responsibilities pertaining to the massage practice. For example:

Nada: The infant shouldn't eat before we do massage for him, or else he will vomit

Bramia: Nodded in agreement

Hani [consultant]: You need to be aware that if parents do a massage and the infant will de-saturate, they might think that they harmed the infant. (FG 2, Hosp. B)

Various concerns in relation to the potential risks in providing massage implementation by parents were noted in all hospitals. There was agreement that massage intervention should be continuously monitored by the staff to prevent any risk to the infant, with some HCPs even referring to the low IQ of some parents. This is to say that some HCPs reported that parents coming from a low educational background might have difficulty in following instructions and cannot be trusted, rather than demonstrating the nurses' attitude as judgmental towards parents, as reported in the following interaction:

Farah: …Do not forget you are dealing with an infant; when you give him to the mother, you should observe both of them… You cannot be secure, maybe he aspirates between her hands, and maybe … the IV line is removed. …You leave your work and stay with the mother and observe how she is doing the massage!"

Sanaa nodded in agreement and added:" You sometimes have parents with a low IQ, so you cannot leave them at all. (FG 5, Hosp. C)

Other concerns raised by numerous participants were related to safety issues and the risk of infection:

Fida: There is a safety issue as well. The infant may slip from the mother's hands when she is doing massage for him; you feel afraid.

Claudia [consultant]: Babies with NEC (necrotizing enterocolitis), unstable infants, on a respirator, intubated and with very low birth weight will be excluded.

Fida: Sometimes, the mother causes an infection because she doesn't wash her hands

Roula elaborated: If the infant passed a stool and the mother did not clean him well, and then she applied crème to his nose, his mouth and his entire body; this is a DISASTER

Maria added: ...Hygiene, if he has a skin breakdown in a certain place... (FG 1, Hosp. A)

Notably, Doris was fearful about the risk of transmitting infection in the case that one nurse would be recruited to apply the massage with mothers on all the babies. She also revealed her anxiety and concern about involving parents in the care.

Doris: ...If you have an infant with an infection, you cannot take a risk (FG 3, Hosp. B)

Roula and Maria from hospital A drew on the importance of the infant's physiological readiness (cue-based massage); i.e., to adjust the massage according to the infant's condition and need, and to respond safely and proportionally to the state of the infant, as reported in the following interaction:

Roula: Now, if the infant is in distress, his mother cannot touch him.

Maria: Sometimes they (babies) refuse. This causes a little de-saturation if you are moving them or while you are doing massage to them. (FG 1, A)

Although the HCPs appeared to appreciate the value and the physiological, psychological and emotional benefits of massage, the issue of safety came first. Several participants seemed cautious about the potential risks in the application of massage by parents, and expressed concerns that related mostly to the state of the infant, type of pressure used, and fear of infection.

5.2.4 Theme 3: Perceived barriers for engaging in the practice of infant massage in the NICU

Given that massage is valued by HCPs, as they discussed many benefits for the parents and infant, it was important to explore the perceived barriers for engaging in the practice. There was consensus among HCPs that the contextual and organizational constraints relating either to the parents, HCPs or the system may influence future massage implementation. Five sub-themes were identified relating to possible constraints for massage including: the staff's perception of the parents' fear of caring for their infant in NICU; the staff's perception of parents' readiness for the implementation of massage; staff overload; staff attitude and readiness; and entry into the NICU and space availability.

5.2.4.1 Subtheme 3.1 Staff perception of parents' fear of caring for their infant in the NICU

Almost all participants saw fear and stress as a major concern for parents. The term "fear" was frequently used by HCPs to indicate the emotional reaction of parents having an infant in the NICU. There was agreement among most participants that parents develop fear as a reaction to the NICU setting. The main reasons might be either that those parents are frightened or that they are not psychologically or emotionally prepared to see their infant placed in an incubator surrounded by machines and staff. There was agreement across all FGs that "Fear" is the main reason impeding the involvement of parents in the care of their infants in the NICU- "infants are too small and fragile"- as noted in the following example:

Farah: Yes, some parents are afraid to touch or hold their infant, especially if he has a "low weight"(FG 5, Hosp. C).

Others expressed doubts about the ability of parents to participate in infant massage, and some even reported concerns about the negative impact of the presence of parents on their infant and on them as staff, as illustrated in the following examples:

Jade: … If the infant moves or something, they become panicky. I mean, they cause us stress sometimes because they are stressed (FG 2, Hosp. B).

Sharing their experiences encouraged participants within the FGs to interact and created a sense of common awareness, as illustrated in the following example:

May: They transferred the infant to the NICU, so the mother showed signs of depression and crying. This separation is very difficult…

Doris: Yeah, they are afraid…

May: Some of them are very afraid; you should stay with her the first time…

Yasmine: In the incubator (couveuse), you put him in isolation. The mother asks fearfully "Can I put my hand in, touch him…

May [interrupts, explaining]: the presence of tubes affects the mothers (FG 3, Hosp. B)

However, mixed opinions were reported by nurses regarding the view that fathers are more tolerant and better able to cope emotionally with the condition of the infant. Some nurses in hospital A reported that they preferred to communicate bad news to the father as the latter seemed more psychologically able to understand/tolerate the condition than the mother.

Maria: … Sometimes we tell the father more dangerous things, which he can tolerate as a man; I mean if the case of the infant is critical …

Interviewer: Do you think that the father tolerates issues psychologically more than the mother does?

Maria: Yes, sure. She delivers … the father can handle more.

Roula: Some of them (mothers) cannot handle, for example, everything at once. You should tell her step by step…

Maria: Or we tell him and then he tells her, I mean. This is how the stories are handled. (FG 1, Hosp. A)

This excerpt shows that fathers are perceived by HCPs as better able to handle the infant's situation in the NICU than mothers.

The FGs created a platform for HCPs to interact and disclose their concerns and encouraged members of the group to share stories about the parents' cognitive level, attitude and reactions, as noted in hospital C, WBFH:

Amal: When the mother enters the NICU and sees her infant, she cries; she doesn't interact with the nurse; she only asks about her infant and what is happening to him.

Hania [nods in agreement]: We surely allow the touch but there isn't anything else that they do. Mothers complain a lot for many reasons; they are stressed about their infants, so they express it in this way, and they become more aggressive.

Zeinab: Some parents are not cooperative. So it depends on the background of parents.

[Talking over each other's voices]

Rabih [consultant]: Some parents are not capable mentally or emotionally to perform this act or intervention; there are parents who fear contact with their infant. In my clinic, the father comes with his 2-3 months old baby, and says: "I still haven't touched him". They are afraid of touching him. They think that he is very fragile (FG 4, Hosp. C).

This excerpt shows that there is a general perception by HCPs that many parents are frightened to touch their infant while others are not ready to come to the NICU and might not be able to apply the massage. There was a consensus that fear is among the most important barriers which renders the implementation of massage by parents difficult.

5.2.4.2 Subtheme 3.2 Staff workload and time constraint of nurses

Although HCPs claimed that they liked the idea of massage, their work demands formed a potential barrier to future massage implementation in the NICU. Participants across the FGs said that they might not allow parents to enter the NICU due to other related issues, especially when there is a sick infant or during rounds. Other factors might be related to staff shortage or the personal attitude of the staff. The HCPs in all FGs provided evidence that staff workload and unpredictable work patterns are major concerns that seems to stand in the way of future massage implementation. Moreover, several nurses said that they preferred not to involve parents in the care as this would take too much of their time and might increase their workload or interfere with their daily routine as illustrated in the following discussions:

Jade: …even if the parents are present, you ought to be with them; it means they have not made you gain more time; on the contrary, you are losing time because you are staying with them and you are answering questions. Therefore, you need a person reserved for them; I cannot tell the mother to do a massage and then go do something else.

Nada: If there isn't a heavy workload, there is no problem

Interviewer: So you think it is hard now to be part of the daily care

Jade: Why should we oblige ourselves?

Tania [loudly, in agreement]: ISN'T IT ENOUGH FOR US THE INTERVENTION WE ARE DOING AND THE LOAD WE HAVE?

Mary: Ah! At 9 pm, there is a heavy workload

Tania [commented loudly]: YOU CANNOT FINISH THE WORK; YOU CANNOT MANAGE (FG 2, Hosp. B).

Reem: … some nurses might have resistance to massage application in NICU because they consider it a luxury and maybe they don't know its benefits, and maybe they have workload, so they are not able to give more time to this. (FG 5, Hosp. C)

Generally, across the FGs, the HCPs highlighted the passive role of parents in the NICU, and some reported that parents might be considered as a source of stress to nurses as they might interfere in their work– this despite the nurses' perception of the importance of touch, specifically touch from the parents (Subthemes 2.1 and 2.2). Yet there were mixed opinions among HCPs about the idea of involving parents in the massage application. Differences across hospitals regarding staff attitude were mostly related to the workload in the NICU. On the other hand, a different perception was noted by Nada the HN in hospital B (NBFH) who expressed a contrasting opinion that involving parents in the care might be helpful to decrease the workload of the nurses over time in the future. However, her opinion did not receive much support by the other HCPs because of current staff shortages as illustrated in the following discussion:

Nada [HN]: Basically, when you teach the parents, they will remove some of your workload, so you need time; in the first phase, you need somebody until the parents become ready.

Jade (interrupts): But when you teach the parents, you are giving more time; I mean you need to stay with them.

Nada [nodded]: It means we need extra staff for massage

Tania (added loudly and laughing):" RN MASSAGE!!!"

All: (laughing)

Nada: We are not opposed to the application of massage here. … but the problem with everybody is time, with the existing number of staff and the existing number of patients… the RNs, who are here, leave the IC and go to help the critical infants. If there is a person assigned to do massage and she is not interrupted, it would be better.

Hani [consultant] (nodded in agreement): It needs time from the girls (nurses) (FG 2, Hosp. B)

A similar interaction regarding time constraints and staff shortage was highlighted in hospital C (WBFH). The nurses' accounts indicated that there was no possibility under the current circumstances in the NICU to apply massage, which reflects that the nurses focus mainly on finishing their nursing rounds such as: changing diapers, NG feeding, routine nursing interventions, and executing medical orders. Therefore, according to the majority of HCPs, in the case that massage would be implemented in the future, time constraints would be a major factor limiting appropriate parental preparedness.

> *Rabih [consultant]: … Basically the time factor is the main barrier for massage application in the NICU. (FG 4, C)*
>
> *Farah: … In the hospital, it is difficult; … the policy here is that each RN has 3 infants, and if you have critical infants, there is no way you have time; it means you are spending 12 hours, the shift here is 12 hours – you are working and running for 12 hours. So I don't think there is a way...*
>
> *Sanaah: …Yes, we accept that the mother comes in if we don't have a sick infant and we don't have a lot of work … But, if we are very busy, we won't be able to allow the mother to enter; we won't work with a sick infant in front of the mother. (FG 5, C)*

The HCPs, especially from hospitals B and C, appeared to hold negative views regarding the feasibility of massage application due to work overload; reporting that they wanted to maintain their work routine.

Reflective journal

Reflection from my observational field notes:

When I did my observation in both hospitals B and C, the nurses were busy most of the time with direct care and their rounds on the infants such as changing diapers, starting the NG feeding, and executing orders, having little interaction with parents or even physicians. This confirmed what the HCPs were saying.

Observation notes July 4, 2014 hospital C 9-10:30am

The HN and other staff were caring for the central line. The residents were doing their rounds as well. Of course, parents were not allowed in. During the rounds, no interaction was noted between junior specialists and nurses. Each was preoccupied with his work. I noticed that nurses were submissive towards residents and physicians. They adjusted their work around the doctors' rounds and schedules.

Similar to hospitals B and C, the HCPs from hospital A (FBFH) appeared cautious and reluctant to embrace the idea of introducing massage to the care due to the pressure of work and the foreseen demands of the intervention. The HCPs felt tied to their daily tasks, as indicated in the following discussion.

Caren: It increases the work for the nurse … adds 10 more minutes.

Interviewer: If you have 6 infants?

Caren: No way, you will become overloaded… and we also have work, I mean, either we will not be able to finish our work properly or we will fail in delivering the information to the mothers. … It needs additional staff of course, and it is not only a matter of extra work; it is the issue of time in order for the patient to assimilate this intervention; there should be assistance from us. You should give the parents the care and the time needed

Malak: If we have a tired infant or a very heavy work load, we cannot respond to them… This will be a negative point for you, so they basically won't enter the NICU (FG 13, A).

When probed further about the feasibility of applying massage on a daily basis, the HN in hospital A stated that the implementation needed time as it would depend on the mother's readiness to work with her infant as well as the unforeseen critical admissions and staff overload:

Interviewer: but we are talking here of a routine on a daily basis, this…

Fida [HN]: Yes, but it is difficult on an everyday basis because we might have an emergency; some infants might be tired or sick, so everybody should be present in this case; only one nurse is making the round during this time, so she cannot give much time to the mother…. The mother needs to get familiar with her infant … It might not work the first time (FG 1, A).

Many HCPs emphasized the parents' need for continuous assistance and staff readiness to answer the parents' questions; therefore, they felt that this would take time and they were not ready to sacrifice this time. If massage is to be implemented, according to HCPs, there is a need for additional staff. Their reasoning: whenever there is extra staff, the quality of the work becomes better because every infant and every intervention is given the time needed.

5.2.4.3 Subtheme 3.3 Staff attitude to parents

In many FGs, the idea of active encouragement for mothers to touch their infants invited debate. Participants shared several anecdotes describing differences in assimilation, cognitive abilities, and IQ levels among mothers affecting their perception that many mothers are fragile and need continuous support. This validated their concern that some parents are not ready to take over tasks, as exemplified in the following interaction:

Fida: Some mothers are spoiled…. They have 4 or 5 children and they tell you: "Stay beside me"

Roula [interrupts loudly]: … SHE HAS MANY CHILDREN, AND STILL SHE ASKS YOU: "Do you know how to burp the baby?"

Maria elaborated: Now it differs from one mother to another; I mean… some mothers have a low IQ

Fida [added]: With some parents, after teaching them for 1 month, they come out of the hospital and still don't know how to feed their infant. I mean the mother does not want to; she refuses; there should be someone helping her at home.

Fida, Maria, and Roula [altogether nodded in agreement]

Maria: We had a special case infant; … we and the mother, every day, the same talk … She left the hospital and she is still calling us … same questions, same answers (FG 1, A)

Many participants voiced their concern over the parents' readiness to perform the massage; it was obvious from the discussions that some HCPs underestimated and doubted the ability of some mothers to care for her infant and some did not trust leaving the mother alone with her infant. Others saw the intervention as a burden on nurses, as illustrated in the following example:

Jade: Lebanese parents are either meticulous or hysterical, so if the mother does massage for her infant now, you should stay with her, you cannot leave her.

All: (general laughter)

Mary: mothers come and they are not able to touch their infants.

Nada: You need to encourage the mother and help her at the beginning. Some mothers cry all the time.

Lima: Mothers might be afraid that something happens to their babies, de-saturation for example; you need to stay next to her, and you cannot leave her. (FG 2, Hosp. A)

Discussion of the emotional impact of the mother's first encounter with her infant communicated a sense of common experiences within the group. This exchange indicates that nurses consider that if massage is to be applied in the future, they should continuously assess the parents' readiness to provide the massage intervention.

Zeinab: You are afraid that they [parents] might make a wrong gesture or act, so…

Amal [interrupted and added]: Or she [the mother] might think this is the nurse's job, why should I do it?

Rabih: 50% of the parents are not candidates for the application of massage and it will be hard to teach them.

Hania: (nodded in agreement)

Maud [consultant]: 30% of parents don't come; you tell them to come to teach them and they don't come.

Hania [nurse]: We have parents who have been complaining that they haven't been participating in any procedure; many parents have been asking to be involved (FG 4, C)

This excerpt shows that Hania, who was nodding and agreeing at the beginning that not all parents are good candidates for the intervention, noted at the end of the discussion that many parents wanted to have a role and complained about not being involved in the care of their child. It seems that knowledge sharing within the focus group allowed for more disclosure among participants.

It was also noted from the participants' accounts that the majority of them encouraged parents to visit their infants, yet most did not involve parents in infant care and few invited parents to touch their infant, except for hospital A (FBFH). In hospital C (WBFH), mothers were only involved in breastfeeding. They were either asked to bring their milk or to breastfeed in the NICU if the infant was able to suckle. As for hospital B (NBFH), there were differing opinions from HCPs. The majority revealed that they did not involve parents in any care. Staff attitudes towards parents and their reluctance to communicate with them or involve them in the care were confirmed by the following observation.

Observation field notes Hospital B, NBFH, Feb. 14, 2014 from 11 am till 1 pm

Shadia was standing alone outside the intermediate care "Elevage" room. She was told by the RN to go out for a while because her infant was being assessed by the ophthalmologist. Then after a while when the doctor left the room, the PN told her: "Why are you standing like this, come in". The mom replied: "The nurse told me to go out". Shadia entered the room and stood next to the incubator and started to watch her infant from the window of the incubator. She looked perplexed, [علامات الحيرة] not knowing what to do. The RN left the room because another infant was a bit bradycardic in the NICU (nearby room),

so Shadia was left alone. No one explained to her what was happening to her infant. She watched her passively for a few minutes and then left the room. There was no clear organization of tasks between nurses, RN and PN. The PN was busy with the storage and filling of the bottles.

After a while…Shadia went in again and stood next to her infant's incubator and was happy to see her smiling, so she said loudly: "SHE IS SMILING!" and smiled too. The PN did not reply and moved the mom aside by saying "Excuse me" and started to work with the infant. The RN came back and told the PN to do the round "tourneh" and feed the infant because she was busy in the NICU (there were 3 infants on respirators). The mom started to watch what the PN was doing with concern and did not interfere, but just commented that her infant had not urinated. The mom said: "She has a birth mark!"[شامّيّة], the PN replied: "I don't know". The mother kept on asking questions about the feeding pattern of her infant despite the non-engaging attitude and limited response of the PN. This shows that the mother was may be eager to be involved in the care of her infant. The concern of the mother made the PN change her attitude and tone of voice, and she told the mother that she can put a chair next to her infant to watch her.

... After a while, the mother turned and told the PN: "Do you want anything? I am leaving; please tell me if you need anything from me". The PN nodded: "No, thank you". The look on Shadia's face told the story of the ambivalent feelings she was facing with courage and a smile. This interaction portrays that many mothers strive to have a role in the NICU and to build trust with the nurses. Then one infant in the crib on TPN was crying; the PN said that he was hungry because he was NPO; she went to him and called his name and said: "The moms here are funny; they do not work and still do not come to visit their infant; his mom never comes here". Although the PN seemed reluctant to assist Shadia at the beginning of the encounter, at the end of the interaction she conveyed the message that she expected parents to be present for their infants despite the restricting physical environment of the NICU.

Reflection from my observational field notes that day:

As a nurse and lactation consultant, I wanted badly to assist the mother and explain to her how to pump her milk and try to put the infant on her breast. My first impression was that the NICU clinical practice is very task-oriented and focused mainly on the physical needs of the infant. Little was being done to promote mother-infant bonding and breastfeeding. This was very much related to the nurse's character and time availability. Mothers were treated as intruders and not very welcome in the NICU. The care in Hospital B (NBFH), which did not reflect that nurses were teaching parents day by day to prepare them for early discharge or be supportive and encouraging for breastfeeding, may have been due to medical focused care instead of FCC, lack of time, and limited staff preparation to include parents in the care.

Therefore, the quality of the parent - HCP social interaction was highly affected not only by the interpersonal relationship between them, but also by the contextual setting. This in turn affected the parents' self-confidence and role inside the NICU.

5.2.4.4 Subtheme 3.4 Entry to the NICU and space availability

Another reported concern among HCPs was space availability. Most HCPs considered that the NICU physical structure was small and any increase in the number of visitors would create a space problem and lack of privacy, especially if parents arrived together. Some participants in hospital B even suggested creating a new setting for this purpose.

Nada: The location does not allow all parents to come to the NICU at the same time.

Tania: It is annoying for us; it becomes very crowded inside.

Nada: Because you see the location inside; it is small…

Carina: If we suppose there is adequate staff, you have the problem of space; it means you are stuck in the same circle…. unless we divide them into 2 groups.

Liz: … It gets really crowded!!

Hani [Consultant]: There should be a room for the parents here; I mean this is done everywhere (FG 2, B)

Similarly, in hospital A concerns were shared among participants that the NICU space was small and open, which might affect the confidentiality, privacy and intimacy between parents and their infant while doing the care/massage. They added that it might create chaos and difficulty in controlling communications between nurses and parents.

Malak: The NICU space is open and if all the parents enter at the same time, they will be annoyed… some even requested that if their relatives come, not to open the curtains so that they won't see the infant; and you cannot say no … The second thing is when it is full inside, there are 10 infants, and the parents come… It is seriously a disaster… If something happens to one of the infants, you won't pay attention …

Interviewer: You mean it will be a mess.

Malak (loudly with hand gestures): YEAH, "THIS MAN YELLS AND THIS WOMAN YELLS", and you don't know who to answer, it's too much. That is, when I am on duty, I allow two parents to enter maximum so that I can control the situation …to respond to them.

Claudia [Consultant]: We use the curtains for privacy when there is a problem, but the problem is that our structure is built like that. (FG 13, A)

Similar concerns were shared among participants in hospital C that the NICU space was small. This fact was confirmed by the observations as well.

Sally: Not more than two mothers can enter to do massage. We have limited space.

Zeinab: There should be a specific time for the parents to come. When there is a round, it is forbidden for them to come.

Amal: It means it should be organized. (FG 4, C)

Observational field notes: May 2014 Hospital C

The place is very crowded with materials and equipment, and very noisy with beepers and monitors. However, the infants' incubators were half covered with blue sheets like

curtains, used specifically to cover the incubators. There is very good attention to hygiene and infection control. Next to each incubator there are materials, a gown and stethoscope for each infant; gowns for doctors and gowns for moms in different colours. Routine care is done silently, with minimal communication between nurses; there is a friendly attitude and the nurses go to pray one at a time at noon in the changing room. The place is clean and instructions are posted on every sink for proper hand washing. Visiting hours are from 10 – 11am and 4 – 5 pm, for mothers and fathers only. Grandparents, uncles and aunts (other family members) are not allowed in. There were minimal visits by parents outside visiting hours, causing parents to experience more stress while waiting outside. A mother was crying in the waiting area outside the NICU while waiting to see her infants. NICU clinical practice is very task-oriented and focused only on the physical needs of the infant.

I reflected on my field notes when I visited the three hospitals:

From my observations in the three hospitals, I felt that when parents came to visit, they felt as if they were intruders or sometimes disturbing the nurses' work, which leads to feelings of embarrassment, resulting in further parental withdrawal.

My observation field notes in relation to space availability in the three hospitals confirmed what the HCPs noted. Parents' visits to the NICU should be more organized, as stated by the majority of the HCPs. From my observation, the major challenges were the limited time dedicated by HCPs to communicate with parents and allow them to discuss their emotions, as well as to assist parents in the delivery of care. The majority of HCPs across FGs highlighted that the NICU context has many factors that limit the parents' participation in daily care. It was noted in the three NICU settings that nurses made an effort with medical and technical support to deliver the needed health care to the infants and to maintain proper reporting and documentation. On the other hand, their accounts indicate that HCPs usually

pay less attention to activities that promote maternal-infant bonding during the infants' hospitalization.

5.2.4.5 Subtheme 3.5 Staff perception of parents' readiness for implementation

The HCPs reported that they do not allow mothers to enter to the NICU when there is a work overload, rounds, a sick infant, or an emergency. Yet many participants noted that parents themselves might refuse to come to the NICU on a daily basis or be reluctant to apply massage for several reasons such as personal commitment, working parents, transportation cost, living a long distance from the NICU, having other children at home, or the mother's health condition.

Staff reported that mothers might be unable to come to the NICU if they are working or have other children at home to care for and they do not have any support at home. This issue was discussed within and across FGs.

Sanaa: If she has more than one baby, she won't come to do daily massage (FG 5, C)

Maria: The mother may have a 10 month old baby at home, for example, so she cannot spend time in the NICU (FG 1, A)

Jade: Some mothers; it depends on their work schedules; they come every day at 5pm…

Nada: Yes, because she does not take maternity leave if her infant is in the hospital. When he goes out, she takes her vacation, so she comes after work. (FG 2, B)

Working parents and economic barriers were issues that were discussed actively across FGs. The majority of HCPs emphasized that many parents are from low socioeconomic backgrounds and unable to pay their bills:

Interviewer: Are parents able to pay rent for a room next to the hospital?

Claudia: You are dreaming; let them pay the hospital fees first.

Fida: The bill is 2 million Lebanese liras (around $1,300) and they don't pay (FG 13, A)

The issue of transportation was also actively discussed among participants within and across FGs. Living far from the hospital might be a barrier which negatively influences future daily massage implementation by mothers. For example:

> *Yasmine: Most of the parents live in remote areas. Some of them live in Akkar (north Lebanon), some live in the South and others live in Zahleh (east Lebanon). Few of them come from here (Beirut, the capital), which means it is difficult for them to come, to tell them to come every day to do massage.*
>
> *Interviewer: It means this is going to be a barrier…*
>
> *All: Yeah (Nodded in agreement) (FG 3, B)*
>
> *Maria: Sometimes the mother delivers and comes to visit when she wants to take her infant home; to this extent, I mean. (FG 1, A)*

The staff commented that the difference between the various mothers' abilities to come to the NICU might also be related to the type of delivery, previous medical history, health-related issues and hospitalization period. For example:

> *Nada: If the mother had a C-section delivery … she can't come directly. (FG 2, Hosp. B)*
>
> *Rabih [consultant]: The nurses are making an effort, but it is not enough and many things don't help them including the duration of hospitalization and the limited time dedicated to education. (FG 4, C)*

Two nurses from hospital B (NBFH) doubted the claim that some mothers had a lack of energy after delivery and were not be able to come to the NICU for this reason.

> *Doris: I told the mother of "baby T" to come to the NICU to talk to her; she did not take a bath for 2 weeks after she had delivered; I mean sorry…she does not have the energy for it [Maelajeladeh]…*
>
> *May [sarcastic tone of voice]: The mother can do this! (FG3, Hosp. B)*

When asked about the parents' commitment, mixed responses were given by the HCPs as to how they perceive the commitment of parents and their readiness to be involved in the NICU, as noted in the following discussions:

> *Doris: Some parents will like it very much*
>
> *May: Some of them do not stay, they see their infant a little and leave … some of them do not leave day and night … We have an infant …Her parents come all the time.*
>
> *Doris: Sometimes, you have fathers who are more concerned than mothers. If you see how they treat their infant… (FG 3, B)*
>
> *Fadia: Some mothers deliver for the first time after 10 years of marriage; they don't believe it; they are very happy; they want to sleep next to their infant all the time. You feel they will assimilate more; they will take care of their infant better. However, some women don't want to. A mother tells you: "The maid, my mother, my husband take care and wake up during the night". (FG 1, A)*

The HCPs' accounts revealed an apparent lack of trust in the parents' role in the NICU. Many HCPs stated that parents are not emotionally prepared, and sometimes the low educational level of the mother is a limiting factor; in addition, the staff is resistant to involving parents in the care of their infants. They seemed to be in control of everything and this rendered the transfer of tasks to the parents quite hard on some nurses, as exemplified by Doris's conversation:

> *Doris: The parents of "Baby T", I don't trust them at all; … Now, I am sure that they love their infant a million times more than me, but they might have a low IQ" (FG 3, Hosp. B)*

From a different perspective, two nurses, both holders of a diploma in child care and management in hospital A (FBFH) were more sensitive to the parents' needs. They both commented on the physical as well as the psychological condition of the mothers that might stop them from coming to the NICU. As reported by Maria, mothers who had twins might have refused to go to the NICU because they felt grief over one of the twins who died, others

have postpartum depression as a result of not having a normal full-term baby, or they might not be psychologically prepared for a possible loss.

> *Maria: If the mother is sick or had complications or had a twin delivery and one died, it will be hard for her to come to the NICU. She will feel stressed and will refuse the other baby. She will not accept that she had two babies and now has only one… Some mothers will develop baby blues and refuse their babies. … Not all mothers accept massage. Sometimes we ask the father, "Why doesn't the mother come?" "She is upset – later on, she will come". Sometimes we miss the mother's presence… for five days, the mother does not come. The reason why is not us … she is either upset or uncomfortable … It will take a lot of time for the mother to be able to do massage for her infant alone. For example, one mother was in terrible pain and she felt dizzy here…*
>
> *Roula: If women deliver by C-section, they might not be able to come the first 2 days, but later they will come, it's normal. (FG 1, A)*

It was agreed among the majority of HCPs across FGs that few parents are able or can be trusted to commit to a daily massage intervention. This explained parental factors such as work conditions, living far from the NICU, transportation costs, having other children at home, and the mother's physical or emotional/psychological condition.

5.2.5 Theme 4: Strategies to facilitate future implementation

It was relevant to explore the HCPs' perceptions of how to facilitate the implementation of massage by parents in the NICU. Facilitators of massage included 2 subthemes pertaining to contextual and organizational factors, with 2 sub-subthemes for the first, and 3 for the second subtheme.

5.2.5.1 Subtheme 4.1 Contextual factors

When asked about the factors that might facilitate future massage implementation, participants identified two important contextual factors in their settings as sub-subthemes: preparation of staff and parents; and parental access to the NICU.

5.2.5.1.1 Preparation of staff and parents

The majority of nurses in hospital A, when asked if massage seemed easy to apply, replied that the main issue in its implementation was the need for staff education and appropriate teaching and support for parents. The HCPs in hospital A (FBFH) showed readiness, awareness of the parents' needs, and a self-confidence regarding teaching and preparing parents for future implementation. For instance:

Caren: Nurses should learn how to do massage first and then teach mothers to do it.

Malak: It is not an issue of whether it is easy; there are delicate things which you should observe so that you can do it… It needs practice and training for the nurses…The mother likes to touch her infant because she loves him …They (parents) want to carry him…. If they do massage, the infant will benefit more than only carrying him… it depends on the parents' IQ… that's why, we, on every visit, every time the mother comes to see her infant, teach her how to take care of him or her.

Interviewer: Do you decide what to teach?

Malak: It depends on what the mother wants…because she starts with the questions; however, I decide what to teach before discharge. That is, I will teach her about the medications, about the bath … before she leaves, I decide on the training because I want to make sure that since the infant is going with his mother, she knows everything. But, when the mother comes to visit, most of the time she asks questions; she is the one who decides what she wants to learn, not me. (FG 13, A)

The accounts of participants in hospital A (FBFH) revealed that there is fertile ground for the implementation of massage application. These HCPs emphasized that massage needs commitment, monitoring and organization on their part.

Similar interactions by most HCPs in hospital B (NBFH) highlighted the importance of staff training. Nurses also emphasized the need for psychological readiness of the staff and parents and the need for additional staff as important factors for future implementation:

Interviewer: Is there any "Protocol" to follow for massage to become part of the routine care?

May: Training should be done first …I may stay with the mother many times …

Interviewer: and if we wanted to apply this intervention within the next 6 months…?

Doris: We should have training first…We should also be psychologically ready for it…

May [interrupted]: We should have more staff…

Yasmine [nodded in agreement]: They should have training, like they have said, and more staff because they obviously don't have time; I mean it cannot be interrupted.

Jenny [nodded her head in agreement]: Yes more staff and training.

Yasmine: It needs to come to us (an order) that this (massage) should be applied.

May: A plan should be made for this subject; a suitable time should be specified.

Doris: It depends on the mother's IQ… Some of them may be able to be taught what they ought to do, and others, even after 20 times, you cannot leave them alone. (FG 3, B)

In contrast, the staff in hospital C (WBFH) suggested integrating massage with the daily bath. However, they showed reluctance to apply massage as an actual and separate intervention. For instance, there was a debate on how the massage might be implemented, by whom, who would supervise its implementation, how much time it would take to train the staff and mothers, and if parents would be able to visit on a daily basis. The area where

hospital C is located is in the suburbs of Beirut, and in general it serves a low socio-economic status community where the fathers are usually the breadwinners and the mothers are usually dependent on the father. As for the teaching done for the parents, the participants' accounts in hospital C revealed that the parents' education, in general, was suboptimal and these parents lacked receiving any attention except before discharge or when the mothers asked. As reported by one nurse, the discharge teaching session was usually carried out directly before discharge and lasted for around 15-20 minutes.

> *Farah: … we do discharge teaching. If the doctor prescribed medicine, we teach them how to give it … We tell them about the vaccines and the doctors' visits, and to observe their infant. …Before discharge, we sit with the mother for 10 - 15 minutes and we give her the instructions, especially if it is her first baby…the mother is curious, she asks… we tell her. Mothers are usually interested in their infants. (FG 5, C)*
>
> *Interviewer: Do you find massage feasible? Can it be applied… as part of the daily work…?*
>
> *Hania: Yes, massage can be done... It can be part of the daily bath routine*
>
> *Zeinab: But before starting to apply massage, there should be training…. for the persons who will apply it later. (FG 4, C)*

It appeared from the participants' accounts across FGs that discharge teaching for parents is practised in all hospitals, but to varying degrees. There was a consensus on the importance of preparing parents and HCPs on infant massage implementation. The majority of participants agreed that staff education should be done first before that of the parents. However, at Hospital A as a FBFH, the staff sensed the needs of parents to a greater extent; three of the nurses are holders of a diploma in child care and management with many years of experience. From the account of participants in hospital A, they revealed that they allowed mothers to ask questions and they tried to promote a positive leaning environment. In contrast, Hosp. B, NBFH, and Hosp. C although WBFH, still in the initial steps of the BFHI process were not

sensitive to parents' needs, as revealed by the nurses' accounts and observation; parents were not encouraged to ask questions during their presence and discharge teaching for parents was done just shortly before discharge.

5.2.5.1.2 Parental Access to the NICU

Although the HCPs in hospitals A and B claimed that they had an open door policy, participants' accounts and the observation field notes indicated that parents are not usually allowed to enter to the NICU at any time they choose. HCPs said that parents are not allowed in when rounds, a procedure, or a sick infant under resuscitation is being carried out. This issue of entry to the NICU by parents and the visiting hours invited debate among participants across FGs. For example:

> *Mary: … We make our rounds at 8 am, we finish, and at 10 am we can give an appointment: we can do a massage session. You can do a demonstration on a doll or on the infant like we have seen now in the video. …We tell the parents: "You can come at 1pm"…so that they will arrive one by one, and so on (FG 2, B)*
>
> *Yasmine: If they are doing the rounds here; we have critical patients … we are doing resuscitation, so mothers should go out; otherwise, parents are always here.*
>
> *Jenny: But visits are usually in the afternoon.*
>
> *May: …. If we have a small number of infants in the IC …we can let parents enter and teach them how to do the massage, and we can let them try it many times… It would be good… We can handle one parent every 2 days, but we cannot have them all on the same day.*
>
> *Doris nodded in agreement: Yes.*
>
> *May: sometimes we teach parents; but not if it is crowded or we are working inside with critical infants. But if we have a small number of infants, we can let the parents enter and teach them how to do the massage …. The mother will feel happy and the infant will feel her presence (FG 3, Hosp. B)*

According to two nurses, Lina and Zeina, in Hospital A, the NICU is very crowded before noon, so it would be better if the mother could enter to do the massage for her infant in the afternoon; but Fida (HN) emphasized that mothers could enter by appointment at any time suitable for them, before noon or in the afternoon, and there was always one nurse available to assist them before noon.

> *Lina: Before noon, nurses do the rounds and blood tests; it is difficult to receive mothers*
>
> *Interviewer: What do you mean? Can you elaborate more on this idea?*
>
> *Fida: They finish everything at 9:30 am, so one nurse takes the medical orders and the other one can do the training. … Every 2 mothers rotate with 1 nurse, and Lina (PN) can come and help when there is a need. … We encourage mothers to come to the NICU and work with their infants … the work should be under the surveillance of nurses (FG 13, A)*

In Lina's account, a conservative point of view was apparent. Her experience as a staff nurse showed that nurses are busy before noon with nursing care and procedures. In contrast, however, Fida insisted that nurses can coordinate their work and time to be able to receive parents at any time of the day. This shows that although there are mixed opinions among nurses in hospital A, the head nurse showed more flexibility in relation to the proposed implementation.

There were differing opinions among nurses in Hospital C relative to the applicability of massage, however, was not as positive as that of the head nurse in hospital A. The following exchange in hospital C shows that although the nurses maintained that they would adjust the visits of parents to accommodate future interventions, they were reluctant. Their responses exemplify the reality of the nurses' mixed opinions towards the parents' entry to the NICU and their involvement in the care.

> *Interviewer: If massage were to be implemented 6 months from now, what are the preparations you should do beforehand?*

Farah: To organize the time of the appointments for parents to come to visit. … not have all of them arrive together; … one visit in the morning, one at noon, one in the afternoon and the last one in the evening or at night.

Sanaa: If we don't have a sick infant and we don't have a lot of work, we can give the mother time.

Interviewer: Does the mother enter and help you in the daily work? Change of diaper?

Reem: we are limiting the visits, one hour in the morning and one hour in the afternoon, and of course, it is forbidden for the parents to stay for a complete hour. So no…the time of visits should not be at the time of care…and if there is work, we won't allow them to enter … We cannot allow them to enter any time they want and for as long as they want.

Interviewer: … Do you think the setting doesn't allow it?

Reem: yes … and we allow only the mother and the father as well (FG 5, C).

Different opinions and practices were described in relation to the parents' visits and involvement in the NICU care. On the one hand, the majority of HCPs across FGs agreed that the NICU was crowded before noon due to rounds and procedures which might hinder the parents' entry leading to HCPs inability to commit. On the other hand, many participants reflected on the key issues for massage to become a sustainable intervention and showed a readiness to engage in the care; many even actively discussed the visiting policy and how to better accommodate the parents' visits within their busy working schedule. Some suggested having two shifts to accommodate the needs of the parents. To facilitate future implementation, massage visits should be organized by appointment and be well planned to prevent overload in the NICU.

In general, HCPs across FGs identified staff education, staff support for parents, planned entry into the NICU by parents and visiting hours as important contextual factors to facilitate massage implementation in their specific settings.

5.2.5.2 Subtheme 4.2 Organizational factors

The HCPs highlighted three important common organizational factors to facilitate future massage implementation in their proposed settings, which were: commitment to the practice, staff shared decision-making, and establishing a protocol and guidelines for massage implementation.

5.2.5.2.1 Commitment to practice

In Hospital A, it became evident from discussions that the HCPs were assertive and aware that they were accountable, communicating indications of commitment and readiness by discussing the way to move forward with massage implementation. For instance, they suggested adding massage as a nursing order. Nursing leadership was apparent in the words of the HN of hospital A, as stated:

> *Fida: This massage should be added on the "Chart of caring activities", so I have an order, I write it: "massage with the mother". Hence, this is not a medical order; this is an instruction for the nurses (staff), and this would be the nurses' role" (FG 13, A).*

Another interaction, in the following example, reconfirmed what the HN stated. The HCPs' discussion in hospital A showed they valued the effectiveness of the intervention and tried to find solutions for implementation. They emphasized that the application of massage should be written as a nursing order as part of the daily care and documented with the vital signs.

> *Zeina: The role of the nurses is to facilitate the application of massage …*
>
> *Lina: Massage application becomes easier when it is an order, so she (the nurse) is obliged to do it like physiotherapy, vital signs, etc…."noted on the surveillance sheet"… Our role is to train the mother, help her and stand beside her (FG 13, A).*

In contrast to hospital A, the nurses' roles in hospitals B and C were more transactional and strictly followed medical orders. For example, when asked about what needed to be done to facilitate the implementation of massage in hospital B, one comment triggered a chain of responses from participants.

> *Doris: Now obliged, I don't know if obliged is the word ... but in the end, if this thing is beneficial for both the mother and the infant, we can start this protocol; because we experience hard times with many parents who have fears about their infants.*
>
> *Yasmine [junior specialist]: You need to see the director.*
>
> *May: A plan should be developed for it (FG 3, B)*

In fact, in hospital B (NBFH), the Total Parenteral Nutrition (TPN) process had been added to the nurses' daily work creating an extra workload and a source of frustration for them. Some even suggested applying the massage themselves:

> *Mary: Remove (cancel) the TPN, and then we can do the massage… The workload will decrease at night between 2:00 and 4:00 am; it is very calm and there is no crowd; we can do massage for the infant at this time, but not with parents (FG 2, Hosp. B)*
>
> *Sanaa: It will be like we are doing the care every 3 hours, an order … We will record it on the work sheet …like any procedure…and then signed that it has been done (FG 5, C)*

Reflection from my observational field notes from Hospital B February 21, 2014.

After the focus group interview, Doris, a senior nurse with more than 25 years' experience wanted to talk more and I felt it, so I stayed in the NICU. She approached me while I was gathering my papers and told me: "You know, I think this is a good intervention: yes, let us do it"; she said: "You know, I usually do it, not the same, but this is done instinctively. I feel that infants need to be touched, so I take them on my chest and rub their back. This makes the infant feel better, relaxed, and I also feel more relaxed as well. I do not have children myself,

so I feel this motherhood feeling when I rub their backs. Despite the workload that Doris was complaining about during the FG, the look on her face when she was talking revealed how doing massage might be very relaxing and rewarding for her and the infant.

It was evident from the discussion that organizational factors such as the HCPs' attitudes and willingness to support the parents were very important elements for a successful future implementation process. When asked about the approach of nurses and doctors, if they might have been interested in applying this intervention or any new intervention according to previous experience, or if they might be resistant to applying massage the majority of HCPs across FGs replied that they were interested in the intervention. However, the HCP's level of commitment and readiness varied between hospitals.

5.2.5.2.2 Staff shared decision making

In hospital A, the staff had a positive doctor-nurse and nurse-mother collaborative relationship, one they identified as a potential facilitator in future massage implementation. The HCPs mentioned that the nursing and medical support for massage as a new intervention would be essential to facilitate future infant massage application by parents; as a result, change would be easier. This was illustrated by the views of the nurses, who reflected that:

Interviewer: Do you expect resistance from the medical team regarding application of massage?

Fida: On the contrary, they say: "You are giving a lot of care, this is necessary care."

Roula: They tell us to care for the infant.

Maria: When you develop instructions for it, they will have control of it and find that this is necessary care, like IV care…

Interviewer: Do you think that doctors would support this idea of massage?

Fida: Of course

Maria: They would agree, yes. They do. HAHA [laughing]

Fida: They would not believe it. They will be very happy. HAHAHA [laughing]

Roula: They would, they would. HAHAHA

Fida: They usually tell us "If you see it is useful, why not?" They would be very happy.

Maria: Because we are closer to the infants, they say, "Do what is suitable". They trust us in the care we give…it is guaranteed. They do not make the issue difficult. On the contrary, Dr. Claudia [deputy department chief] brings us the oil (FG 1, Hosp. A).

In hospital B, on the other hand, decision making was more hierarchical as revealed by many of the HCPs. Doctors are usually the decision makers and most in control of any potential future massage implementation, as exemplified in the following discussion:

Yasmine [junior specialist]: Yes, there would be a discussion about it in a meeting at the departmental level, not with us; it doesn't concern us as residents.

Doris: Not only the directors, the doctors also.

Yasmine: No, I mean the doctors who are in charge of the administration … a meeting should be held first to set the rules. Dr. S, the one in charge of the NICU, should gather the Nursing Coordinator and the Head Nurse; she should talk to them, and then they should hold a meeting with all the nursing staff and residents.

Doris: And then we should apply it.

Yasmine: This means there should be a medical order (FG 3, Hosp. B)

A similar interaction in hospital C reflects that decision making for any new intervention is usually made by doctors; if they are in favour of massage they will facilitate the implementation, as reported:

Interviewer: What is the last intervention you did as a new procedure in the NICU?

Rabih [consultant]: The pain protocol; we are working on it …We are convinced of this idea and the directors would also be convinced of the idea.

Interviewer: Can you elaborate on how the directors would be convinced?

Rabih [consultant]: Usually, we convince them.

Zeinab: It depends on the evidence; it should be validated and backed up with research.

Hania: If the doctors are convinced, everything will be OK (FG 4, C).

Reem: I am willing to apply it as something specific in the NICU. …if there are no objections to the idea of massage in principle….the medical team would like this (idea) because every doctor is concerned about what you can offer to his patient (FG 5, Hosp. C)

A notable difference between the three hospitals was apparent. The accounts of hospital A reflected the strong trust relationship between nurses and doctors in contrast to hospitals B and C, where the doctors were powerful and held control of the decision making and leadership. The participants' accounts were highly influenced by their educational background and the contextual and organizational structure of the NICU.

5.2.5.2.3 Establishing a protocol and guidelines

The HCP accounts in hospital A revealed that previous organizational support for the cocoon (nesting for infants) experience was conducive to the future application of massage in the NICU. The following discussion showed the administrative steps that would need to be taken by the hospital directors for any future implementation of the new intervention.

Claudia: It needs either somebody who takes it as a dissertation, "thesis" [memoire], or someone who launches the procedural concept; … It is like when we introduced the cocoon; we gave a thesis to a nurse and that's why they introduced the cocoon … It was implemented by a full time person… who does it as a thesis from the bottom of his heart.

Fida: It goes down as an imposed order "ordre imposé", and it is included in the activities…the "instructions of activities/care ", like physiotherapy… (FG 13, A)

Claudia [consultant]: The health care system in our institution is supportive if the intervention proves to be beneficial. But, of course, we put clear inclusion/exclusion criteria for the application of massage. (FG 1, A)

When asked about the nurses' role in implementation, the head nurse said:

Fida: My part will include training and then observing closely because the PQI (project quality indicator) will go up from me to the directors so they agree… Even the general director will need to sign off on it (FG 1, A)

Physicians and nurses in hospital A had long discussions on how to incorporate massage in their daily care. Their enthusiasm for the massage application was apparent as they related it to their current practices and its perceived importance. They were willing to incorporate massage in their daily care since it related to oil application, and their previous experience with the application of cocoon intervention.

In hospital B, the following discussion reflected the hierarchy and organizational steps that would need to be taken by the hospital directors for any future implementation of the new intervention, as reported:

Nada: It passes first to the nurses, who do the procedure; then it is sent to quality control to get their approval; the latter then sends it to the Medical Director, who gives it the OK, so it becomes a protocol.

Tania: and it will have a code.

Hani: You have already taken the Internal Review Board's (IRB) approval …which means, in principal, you have also taken approval …

Nada interrupts: the Directors' approval.

Hani: and the Ethics Committee; so, in principal, it should not take time for you because it is approved (FG 1, Hosp. B)

In hospital C, the steps that would need to be taken by the hospital directors for future implementation of the new intervention were highlighted. However, there were mixed opinions on the feasibility of its application, the role of physicians and nurses who would be

following its implementation, the protocol, and the guidelines that would need to be developed. Most HCPs showed concern though willingness to apply this intervention:

Rabih [consultant]: We want you to give us the studies in favour, Ok? …This subject is easy if the nurses have time".

Zeinab: Because there is something called "yearly revision of protocol" in the departments, massage would be considered an addition; …and it will pass on to the quality control department and the medical directors to take a code and it can then be applied.

Maud [consultant]: This training is easy …you prepare the subject and the content…

Zeinab: And we can, over one month, do a small study …I mean, how many mothers were cooperative? … All the nurses here are mothers. I think they would like this subject.

Talia [junior specialist]: Maybe at first they would feel annoyed a little bit because it will take time, but little by little, it will become a routine thing.

Rabih [consultant]: You should persuade them that the idea is beneficial …We have a homogeneous and cooperative team in the NICU.

Maud [consultant]: If there is always monitoring and supervision, sure it will be applied

... If we add it as a routine act on the flow sheet, we will check if it is applied and how the nurses are coordinating with the parents. This is, of course, our role.

Zeinab: your role or the coordinator's role or the head nurse's role; she should monitor the application as well; it means she has the role of follow-up. (FG 4, Hosp. C).

The majority of HCPs emphasized the importance of massage as an intervention. In addition, the HCPs in the three hospitals also showed a willingness to apply this new technique while taking into consideration the barriers and facilitators that might hinder or promote its application. However, staff in hospital A, FBFH, was more explicit in revealing their

commitment to the practice, staff collaboration, and the possibility of establishing protocol and guidelines for future massage implementation than the other locations.

Reflection from my observational field notes from Hospital A:

I went two times in the morning and two times in the afternoon. The setting was crowded in the morning and calmer in the afternoon. However, the head nurse and the nurses were welcoming. They were able to manage the time with visitors. Parents were allowed to enter the NICU one by one and they were well assisted by nurses. Some mothers brought their expressed milk, but none of them were breastfeeding in the NICU.

5.3 Summary

These FG findings clarified the perceptions and attitudes of the HCPs towards infant massage as a culturally acceptable form of intervention and explained the cultural, contextual and organisational processes that might limit or facilitate its application in the NICU (RQs 2&3). Participants across the FGs agreed that massage is a cultural and intergenerational practice, highlighting the physiological, psychological and emotional benefits of massage. However, some expressed their concern about how it might work and the safety and risks of its implementation by parents, thus answering the second research question.

As for the perceived barriers and facilitators for massage implementation (RQ3), there were mixed opinions. The HCPs' concerns were related to the parents' fear generated by the NICU setting, fear of touching the fragile infant, the staff's attitude towards the parents, staff workload, entry to the NICU, and the staff's perception of the parents' readiness. While some HCPs were in favour, the majority had concerns relating mainly to time constraints, staff resistance, proper implementation and workload, as well as entry to the NICU and space availability. According to many of the HCPs, massage might interfere with daily care. The majority highlighted the need to add more staff. Moreover, many nurses showed a resistance to involving parents in the NICU care, and some even showed a preference in applying the massage themselves rather than having the parents do it. Practical factors relating to the parents were also highlighted such as the parents' emotional and physical condition, the

parents' fears and anxieties about touching/handling the infant, the NICU's physical environment, the parental level of education, and the living conditions of the parents and transportation issues.

The HCPs in general demonstrated an awareness of the potential positive effect of introducing massage given by the parents; however, they emphasized the importance of having extra staff and a protocol for teaching nurses and training parents. Also a commitment to the practice, staff shared decision-making, and establishing a protocol for the parents' visits were discussed as important issues to guarantee the smooth application of massage. This answered the third research question and enabled a further understanding of the perceived barriers and facilitators for engaging in the practice of infant massage in the NICU.

This chapter addressed the findings of the second phase of the study and answered research questions 2 and 3 from the HCPs' perspectives. To complete the picture, the synthesis chapter follows in light of the overall aims and objectives of the study.

CHAPTER 6 : COMPARISONS BETWEEN HCP AND PARENTAL FOCUS GROUP FINDINGS

"We stand for 5-10 minutes, we feel annoyed because the nurses are busy working…

we feel shy to stand there more than that…" (John - parent)

"Isn't it enough for us, the intervention we are doing and the load we have?"(Tania - Nurse)

6.1 Introduction

This chapter presents a critical analysis and subsequent synthesis of the similarities and differences in the findings generated by focus groups with parents and HCPs. It addresses the fourth and fifth research questions.

6.1.1 Research questions

4. What are the differences between the perceptions and attitudes of parents and HCPs regarding the application of massage in NICU?

5. How might the interplay between the cultural and contextual factors influence the future implementation processes of infant massage in Lebanese NICUs?

6.2 Findings

For consistency, this chapter will follow the same theme and subtheme headings as chapters four and five. These are grouped together under four broader themes focusing on understanding infant massage, the perception of benefits and risks, the perceived barriers for engaging in the practice in the NICU and the strategies available to facilitate future implementation by parents as denoted by cultural, organizational, contextual and individual/collective factors (Table 6.1). Similarities and differences between the parents' and HCPs' findings are illustrated by quotations from transcripts and supported by observational

data and field notes. The parentheses following each excerpt below denote the focus group number and whether it was provided by a parent or HCP (P and HCP respectively); for example (FG 7 P, Hosp. A).

Table 6.1: ***Comparison between HCPs' and Parents' focus group findings***

Themes and Subthemes	**HCPs**	**Parents**
1. Understanding infant massage		
1.1 Familiarity and acceptability	✓	✓
1.2 Lebanese cultural and intergenerational practice		
▪ *Compared initially to oil application in NICU*	✓	
▪ *Easy to implement*	✓	
▪ *Compared to intergenerational practice on full-term infants*	✓	✓
▪ *Inclined to implement the concept but concerned about the small weight of the infant*		✓
2. Perception of benefits and risks		
2.1 Touch as a fundamental human need		
▪ *Infants need to be touched*	✓	✓
▪ *Parents by instinct want to touch their infants*	✓	✓
▪ *Infants need to experience "touch" by biological parents*		✓
2.2 Physiological, psychological and emotional benefits		
▪ *Physiological: relaxing; relieves pain and colic; promotes blood circulation, sleep and growth; decreases stress*	✓	✓
▪ *Psychological: counters infant isolation, facilitates breastfeeding, fosters parent-infant bonding*	✓	✓
▪ *Emotional: prepares parents for discharge and builds parents' confidence in providing care for their infant*	✓	✓
▪ *Provides emotional support for the infant, parent and nurse*	✓	
▪ *Enhances the immune system and improves metabolism*	✓	
▪ *Promotes better relationships between family members*		✓
▪ *Promotes communication and trust in hospital*		✓
▪ *Strengthens muscles and bones; olive oil is nourishing*		✓
2.3 Risks and safety issues		
▪ *Questioning the risks and health-related safety concerns*	✓	✓
▪ *Type of pressure*	✓	✓
▪ *Physical state of the infant*	✓	✓
▪ *Fear of infection*	✓	✓
▪ *Technique-related safety concerns*		✓
▪ *Duration and infant position*		✓
▪ *Consequential fear of causing harm*		✓
▪ *Possible addictiveness*		✓
3. Perceived cultural, contextual and organizational barriers that prevent parent-engaging in the practice of infant massage in NICU		
3.1 Fear and lack of trust		
▪ *Negative, stereotypical view of parental abilities*	✓	
▪ *Lack of trust in parents' capacities*	✓	
▪ *Staff perception of parents' fear*	✓	
▪ *Fear of touching the small fragile infant*		✓
▪ *Fear resulting from unfamiliar high-tech NICU environment*		✓

3.2 Perception of parents' readiness and role expectation ▪ *Parents' inability to commit* ▪ *HCPs focus mainly on medical interventions* ▪ *No perceived role for parents – passivity* ▪ *Inadequate preparedness* ▪ *Total dependence on HCPs*	 ✓ ✓ ✓	 ✓ ✓ ✓
3.3 Staff workload and time constraints ▪ *Staff shortage and time constraints* ▪ *Lack of staff support within the current system and staff work schedules*	 ✓ ✓	 ✓ ✓
3.4 Staff attitude ▪ *Staff resistance* ▪ *Staff want to be in control* ▪ *Nurses as substitutes for parents* ▪ *Suboptimal preparedness of parents to care for their infants*	 ✓ ✓ ✓ ✓	 ✓ ✓
3.5 Entry to NICU and space availability ▪ *Restricted visiting hours* ▪ *NICU physical architecture: Open space and lack of privacy*	 ✓ ✓	 ✓ ✓
3.6 Individual / collective barriers • *Staff not ready to commit* • *Staff not ready to engage parents* • *Physical condition of infant/mother* • *Living far and transportation cost* • *Parents' occupations and other responsibilities* • *Lack of training and support by HCPs*	 ✓ ✓ ✓ ✓	 ✓ ✓ ✓ ✓
4. Strategies to facilitate future implementation		
4.1 Contextual and organizational factors ▪ *Parental access to NICU, space availability and privacy* ▪ *Adequate staffing and administrative support* ▪ *Staff education and preparedness* ▪ *Modification of workload and recruiting extra staff* ▪ *Integrating into routine practice* ▪ *Establishing protocol and guidelines for monitoring* ▪ *Parents being accepted and welcome in NICU* ▪ *Parents' education and optimal preparedness / empowerment* ▪ *Professional support, communication and encouragement* ▪ *Gradual implementation and continuous monitoring*	 ✓ ✓ ✓ ✓ ✓ ✓ ✓	 ✓ ✓ ✓ ✓ ✓
4.2 Individual/collective factors ▪ *Willingness to commit and engage parents* ▪ *Shared decision making* ▪ *Parents' willingness to commit and to play a role in NICU*	 ✓ ✓	 ✓ ✓

6.2.1 Theme 1 Understanding infant massage

6.2.1.1 Subtheme 1.1 Familiarity and acceptability

The concept of infant massage was already well-known by both HCPs and parents as part of their cultural belief system, social norms and practice. Both HCPs and parents reported that they performed some form of massage for their newborns. For instance, nurses

seemed to compare what they currently do with preterm babies such as oil massage for hydration, sponge bath, or caressing to the massage seen in the video for preterm infants. In contrast, the parents compared the practice seen in the video to the massage performed on full term babies as practiced in the Lebanese culture.

May: it is in our culture. We caress the baby …and massage his back (FG 3 HCPs, Hosp. B)

Nahla (GM): I used to do it for my children … after the bath…with olive oil … like the way she is doing the back in the film… and at the end I do the exercises (FG 7 P, Hosp. A)

Massage was familiar and acceptable to both HCPs and parents as indicated in Table 6.1.

6.2.1.2 Subtheme 1.2 Lebanese cultural and intergenerational practice

Both HCPs and parents were similarly positive about the idea of massage in general and compared it to the traditional cultural practice. They tried to perceive the close relationship between the massage application in the observed video and the intergenerational practice of massage done on full term infants. Similarly, as indicated in Table 6.1, both groups could easily identify with the practice and shared their narratives within their groups. They recounted their memories by describing personal experiences of newborn massage often carried out by a parent or other family member.

Parents generally had concerns about the small weight of the preterm infant. The massage as shown to parents in the video for preterm infants was considered new since these infants were considered small and fragile. As shown in chapter 4 (Subtheme 1.1), other family members were influential in shaping the views and decisions that mothers made about their infants, and these were consistent with claims by HCPs about the expected help that mothers usually receive with their newborn infants from other family members.

Aziza (MIL): Yes, you [referring to the mother] and I will do the massage for the twins together after discharge, if God wishes (FG 11, P, Hosp. C)

Doris: usually mothers rely on other family members [her mother/mother in law] for support (FG 3 HCPs, Hosp. B)

Certain forms of massage were considered by both groups as a cultural and intergenerational tradition and an existing historical and familiar practice, such as rubbing the full term infant with olive oil after a bath and/or doing exercises for the extremities (Swedish exercises).

6.2.2 Theme 2 Perception of benefits and risks

6.2.2.1 Subtheme 2.1 Touch as a fundamental human need

There was consensus by both parents and HCPs that touch is a vital intervention and a human need. *'Infants need to be touched*' and '*Parents by instinct want to touch their infants*' were reported by both groups of participants. The issue of touch as a human need was repeatedly raised across FGs, as was the importance of having the biological parents do the touching. These comments illustrate the importance of parental touch and the psychosocial dimension both groups of participants attributed to the presence of parents in the NICU. However, in practice, a lack of adequate parental involvement in the NICU was reported (as noted in my observations) irrespective of massage. This was exemplified by John and Malak.

John: ... If I do not touch him [infant], I feel myself wrong; ... I feel I am distant from him. I talk to him because I feel that he may need to hear my voice. ... As close as the nurse responsible for him in the NICU is to him, it isn't like having the feel of his own biological mother and father, who he resembles genetically. (FG 9 P, Hosp. B)

Malak: some babies cry all the time, no matter what you do to them, they don't stop crying; and when their mother comes, they become silent (calm). (FG 13 HCPs, Hosp. A)

Tania: massage is very good and beneficial for the baby. It is a pity to put him in the couveuse and isolate him from the world. (FG 5 HCPs, Hosp. C)

6.2.2.2 Subtheme 2.2 Physiological, psychological and emotional benefits of infant massage (infant, mother, nurse, and hospital)

Both groups of participants perceived massage as a builder of parent-infant attachment and touch as a physiological need that promotes blood circulation and relaxation, and decreases stress. However, only the parents further reiterated that culturally and traditionally olive oil massage for newborns is associated with decreased colic and better sleep as well as positively affecting the infant's growth. The parents' and HCPs' viewpoints were strongly influenced by cultural factors that determined their thoughts and feelings about infant massage at the personal and family levels in their own environment and daily life. The older generation, specifically those from areas of Lebanon with a strong tradition of olive oil production, appreciated this practice and demonstrated a willingness to apply it in the NICU.

Aziza (MIL): …I put olive oil, we rub … and we massage … in a circular way… Olive oil is nourishing… He sleeps all night. This is how I raised my children… I can do this for my granddaughters (FG 11 P, Hosp. C)

Jade: this care gives the child a little emotion; it makes up for the mother-infant detachment …, it compensates a little. … I carry the preterm infant sometimes and I feel happy with him, I am more attached to him, I love him more and I feel he is more comfortable. (FG 2 HCP, Hosp. B)

In general, HCPs and parents reported a good knowledge of health related physiological, psychological and emotional benefits of massage attributed to their years of experience and education as well as their cultural beliefs. One difference between the two groups was related to the belief about enhancing the immune system and improving metabolism as reported in the HCPs' FGs compared to the parents' FGs who stressed the benefits of massage in strengthening the muscles and bones.

Both HCPs and parents illustrated the emotional and psychological benefits of massage in decreasing the mother's and infant's stress, preparing the parents for discharge

and countering infant isolation and mother-infant separation. Moreover, several parents and HCPs mentioned that massage would facilitate breastfeeding, as exemplified by Jade and Souheir.

> *Jade: There is a saying "caring and affection bring milk to the mother" …You should prepare the mother for discharge way ahead of time. (FG 2 HCP, Hosp. B)*
>
> *Souheir: The mother's touch is important for the child because it gives him affection (FG 10, P, Hosp. B)*

Although both groups noted the emotional and psychological benefits to parents in decreasing stress and facilitating breastfeeding, only the HCPs identified additional benefits. As shown in chapter 5 (Subtheme 2.2), the HCPs emphasized that massage might provide emotional support and embrace communication between the infant and nurse.

> *Roula: Massage is the connection between you (the nurse) and the baby (FG 1 HCP, Hosp. A)*

6.2.2.3 Subtheme 2.3 Risks and safety issues

Although both the parents and HCPs generally agreed on the benefits of massage, there were some differences in perception and attitude between them in terms of potential risks and safety concerns in preterm infants. As indicated in Table 6.1, both groups had concerns about the condition of the infant, the pressure used and the possibility of the infant contracting an infection.

> *Reem: … Premature babies may contract infection from the air if there are many people coming into the NICU… (FG 5 HCP, Hosp. C)*

HCPs focused mainly on the condition of the infant, in particular emphasizing that massage should be avoided with high risk /intubated infants and should only be introduced to stable infants. The parents' main concerns however, were focussed on technique related issues, infant position/turning the infant, risk of infection, and duration of the massage as they perceived their preterm infants as fragile and delicate.

Two fathers expressed a substantial amount of fear about the condition of their preterm infants and consequently the inappropriate application of massage.

Charlie: … The most important thing is that the parents do the massage in the right [correct] way, not to harm their infants instead of benefiting them because the infant is sensitive and still fragile [weak]; his bones are thin; the least mistake may do harm … Now, when the infant grows older… he may become addicted to it…

Souheir: I have noticed here … a risk in this topic "massage". If there are fingernails or … bacteria under the fingernails … (FG 10 P, Hosp. B)

This fear was also echoed by a mother who said that although massage comforts the infant, she thinks it should not be forced on parents. She added that some parents might not be competent enough to even turn the infant from side to side.

Both HCPs and parents emphasized that massage needs time and education to be applied.

Rima: I need enough time and the opportunity to learn this at the hospital. I couldn't touch my baby at the hospital. (FG 9 P, Hosp.B)

Maria: … It will take a lot of time for the mother to become able to do massage for her baby alone. (FG 1 HCP, Hosp.A)

6.2.3 Theme 3 Perceived cultural, contextual and organizational barriers for engaging in the practice of infant massage in the NICU

6.2.3.1 Subtheme 3.1 Fear

Mothers, more than fathers and other family members, expressed their fear of their child's unknown high-tech environment and their concern about their ability to touch him/her. This was a source of anxiety, fear, and frustration for all parents observed across the FGs.

Rana: … I am telling you that I am afraid of machines. Maybe something happens, a cut tube or… (FG 7, P, Hosp. A)

The HCPs and parents expressed fear, but shared the same concerns in relation to the risk of infection and the vulnerability of the preterm infant to contract diseases which made some parents uncomfortable. These concerns were identified by parents as a source of anxiety in making the decision to engage in the care. These messages illustrate how this would impact the parents' and HCPs' communication and trust relationships.

> *Fida: Sometimes, the mother causes infection because she doesn't wash her hands well (FG 1 HCP, Hosp. A)*
>
> *Nahla (GM): …They don't let me enter; I mean, because they [HCPs] fear infection. (FG 7 P, Hosp. A)*

Although parents agreed that massage was beneficial for the growth of their infants, the issue of fear outweighed the idea of massage and its benefits as reported by John.

> *John: I am concerned about the infant's safety. I need to guarantee/ ensure that my infant is safe first, and massage will come later, especially since the infant is preterm. (FG 9 P, Hosp. B)*

This fear compares similarly with the quote by Doris that shows nurses to be reluctant to involve parents in the care out of fear and highlights further constraints on the implementation of massage in the NICU.

As shown in chapter 5 (subtheme 4.2), older senior nurses were observed in hospital B (NBFH) to have more resistance to change in contrast to younger nurses who exhibited more flexibility and readiness to apply massage.

> *Doris: Now I am obliged… if this thing is beneficial for both the mother and the infant, we can start this protocol (FG 3 HCP, Hosp. B)*
>
> *May: Sometimes, if we have time, yes, why not. I am doing it even without it being implemented … (FG 3 HCP, Hosp. B)*

The perception of fear was echoed in both the parent and HCP FGs but was more evident in the parents' discussions. Parents felt vulnerable, particularly in relation to the consequences of prematurity on their infant and fear for their infant's life. Three fathers expressed their

willingness to engage in infant massage even with the absence of past experience and despite their fears, however, the neutral messages they received from HCPs, reinforced their cultural perception of the expected passive role of parents in the NICU as shown in chapter 5 (Subtheme 3.1).

6.2.3.2 Subtheme 3.2 Perception of parents' readiness and role expectation

Both parents and HCPs across the FGs recognized the non-participatory, passive role of parents in NICU. Parents admitted that their role was limited to observation, and that the nurses played a substantial role in the care of their infants. The following excerpt illustrates the anger and frustration of a mother of twins who was not encouraged or supported to touch her infants in the NICU.

Amina: … As if I hadn't been pregnant, as if I haven't delivered and haven't done anything… (FG 11 P, Hosp. C)

HCPs shared the same view regarding parents' role expectation.

Doris: We are not used to the fact that the mother enters and works with her infant in the NICU (FG 3 HCP, Hosp. B)

HCPs generally felt that parents were unable to participate in the care. As described in Table 6.1, they felt that they do not have time, and parents would not be able to perform and commit to this intervention.

Hania: Time is the most important thing; there are some doctors and nurses who don't have time; they do things very quickly. (FG 4 HCP, Hosp.C)

Roula: Mothers who live far, I don't think they will come every day, because some of them are coming from Akkar [remote area]; they come every other day. (FG 1 HCP, Hosp.A)

It should be noted as a similarity between the two groups, both discussed (in addition to massage issues), other concerns such as fear of the NICU, fear of the infant's death,

vulnerability of the preterm infant, challenges in visiting and entering the NICU, parent-infant attachment, separation, and breastfeeding.

6.2.3.3 Subtheme 3.3 Staff workload and time constraints

HCPs across all the FGs complained of staff shortage and time constraints. They had major concerns related to insufficient time and expressed feelings that massage might add to their work load. This was echoed through the nurses' stories and anecdotes, as shown in chapter five (Subtheme 3.2), to demonstrate how heavy their work load was.

> *Tania: Aren't the interventions we are doing and the load we have enough? (FG 2 HCPs, Hosp. B)*
>
> *Jenny: We feel sometimes that the baby needs the parents' touch; that is why we tell the mother sometimes to use her hands and stroke her baby. But because of the time shortage and the overload, we cannot do all these things. (FG 3 HCPs, Hosp. B)*

As indicated in Table 6.1, these claims were also confirmed by the parents, creating frustration among participants in FGs and inviting much debate and discussion. The majority of parents claimed that the staff limited their access to the NICU, especially when there was a sick infant or during rounds. The latter perception implies that parents are aware of the contextual and organizational factors that might limit their participation in massage. Many parents expressed their concerns about the current practices and staff work patterns that limited their participation in the care in general. As such, several parents complained of the inadequate support by the HCPs due mainly to a lack of time, such as HCPs being busy with sick infants and work overload, making parents unable to enter the NICU, as highlighted by many.

> *Enas: … The other day we came, we couldn't enter; there was a sick infant and they were all working with him; I mean we couldn't enter!! (FG 8 P, Hosp. C)*

Reflection from my diary after conducting member checking:

After completing all the FGs with HCPs and while working to finalize the analysis, I presented a summary of the emergent findings from the FGs to two NICU nurses from two hospitals to confirm the members' perspectives and personal viewpoints represented in the findings and the interpretation of the collected data. For instance, Mary from hospital B said: "Yes, I agree with the findings that you are presenting. We [nurses] can barely finish our work, how can we also teach her [the mother] to do massage and stay close to her?"

6.2.3.4 Subtheme 3.4 Staff attitude towards parents

Many parents stated that if the doctors and nurses are doing their rounds, this will delay their entry into the NICU. This was echoed in the views of nurses who stated that they want to be in control and do not like the idea of being observed by parents while administering routine care. This subtheme demonstrated the level of resistance HCPs felt in relation to the presence of parents in the NICU. The mere fact that parents are allowed in the NICU at any time seemed to disturb their work pattern and get in the way of other work, expressed by several nurses across FGs.

Interviewer: … You mean there will be a disruption in your routine care?

All agreed by nodding their head (Yeah)

Doris: It needs time… You can accept them, you get along with them for 15 minutes, half an hour, and later what? You have your own work to do.

Yasmine: …They interfere in issues that are not their business… and if you try to explain things to them, they won't understand because they are not in this field ….

Doris [Interrupted]: For example, you have a mother who is caressing her infant; you cannot insert an IV to an infant in front of his parents; they will say: "Oh! See what she is doing to our infant"… [Doris making gestures with her hands] … Parents can't accept that you might be causing pain to their children (FG 3 HCPs, Hosp. B)

The HCPs' difference in attitude can be understood to some extent in terms of their personal commitment to the care of the infant; different from the majority of parents who showed more readiness to commit. This difference was observed from a consultant in hospital A, FBFH, who illustrated the use of massage in her clinic. She was in favor of the parents of the preterm infant being taught the massage as well. She believed that parents of preterm infants would appreciate such an intervention as it would decrease their stress.

> *Claudia [consultant]: Very good… I have been doing this [massage] for 20 years in my clinic for colic relief. I teach this technique to parents, but not all people are ready to do this. But, in the case of a preterm infant, we need to do this because parents are very concerned and feel stress about their infant and they want such an intervention for them (FG1 HCPs, Hosp. A)*

On the other hand, this attitude was an exception to most of the staff, and quite unlike the consultant's view from Hospital A, parents, particularly from hospitals B (NBFH) and C (WBFH) provided a rich description of the lack of preparedness and their frustrating experiences in the NICU. Many parents seemed to experience a lack of communication with the nurses, and many affirmed that the nurses were taking their place. They believed this to be the situation necessary to accept in the NICU. For instance, one father mentioned that it was his right to touch and massage his infants in the NICU. However, he was not encouraged to do it or even invited to participate in the care of his infants. In fact, the parents emphasized the need for encouragement and support from the HCPs. Many parents stated that they felt like intruders and were frustrated not to have any role in the care of their infants as indicated by Amina:

> *Amina: … I only visit the hospital; I watch them through the incubator and leave (FG 11 P, Hosp. C)*
>
> *John: I am originally living the experience; I mean, if you tell me: "Leave your work and sit with them to caress them"… I will surely do that because I want to do it without anybody telling me to. (FG 9 P, Hosp. B)*

The majority of the HCP's views identified three categories of parents. The first category was afraid of the NICU environment and the tubes connected to their infant. They had fears about touching the preterm infant as they perceived him as fragile and small; they preferred to observe him/her from a distance. This was similar to many parents' views that revealed the HCPs as having no tolerance for mistakes. Particularly, they had fear for the life of their infant and fear of touching, holding or even turning the infant.

The second category identified by HCPs consisted of parents that showed interest in touching their infant, but asked for continuous assistance as they were afraid to harm the infant. Thus, this was similar to many parents' views who reported that they needed assistance all the time in order to protect the health condition of the infant and ensure not to make any mistakes. As a result, they perceived the need to be instructed by the HCPs.

The third category that was identified by the HCPs was the minority of parents who overcame their fear. This is similar with several parents' views that showed a willingness to interact and care for their infant and who indicated a readiness to take part in the daily care and to apply massage.

6.2.3.5 Subtheme 3.5 Entry to NICU and space availability

The majority of parents and HCPs discussed and generally agreed on the issues of space availability and NICU visiting hours. Many HCPs and parents claimed that the NICU could only accommodate the application of massage by one parent at a time so they could stand comfortably within in the space constraints to do the massage. With consensus, most HCPs considered that the NICU physical structure was small and any increase in the number of visitors would create a space problem, especially if parents arrived together as mentioned in chapter 5, theme 3.4 . It is also noteworthy that there were a number of limitations that both HCPs and parents drew upon. Mainly, the NICU physical architecture is an open space and gives no privacy to parents.

Nada: The location does not allow all parents to come together to the NICU

Tania: It is annoying for us; it becomes very crowded inside (FG 2 HCP, Hosp. B)

Restricted visiting hours was another concern shared by both parents and HCPs. Although the HCPs claimed that on regular days parents could enter the NICU and nurses could give them support and time. At other times when there was a sick infant or a procedure, the nurses would be overloaded and preoccupied with the infant in question, so parents were not allowed to come in. This situation happened frequently in the three hospitals as reported by the HCPs and further validated by the parents' perception of the nurses' time constraints and the observations.

Observation notes from Hospital C May 9, 2014 11am - 2pm

Nurses give bottle feeding and do documentation next to the baby incubators. No cup feeding and no breastfeeding rooms. Only a chair is available in a corner for mothers who want to breastfeed. No place for the mom to sit next to the incubator; they come in and stand next to the incubator and only touch or observe across the incubator. The door of the NICU is locked and entrance is only allowed by the staff inside the NICU (bell from outside).

Observation notes from Hospital C July 4, 2014 8 Am

The mother-in-law was not allowed to enter to the NICU, only the mother. Nurses were very busy with their daily rounds. They were doing central line changing and care. Afterward, the residents' rounds of the NICU were conducted. The mother was only allowed to come in for BF outside visiting hours.

6.2.3.6 Subtheme 3.6 Individual / collective barriers

This subtheme explains the divergent perceptions of parents and HCPs in regard to individual /collective barriers for engaging in the practice of infant massage. Different factors were identified by each group that could prevent their commitment. As for the parents, they seemed to struggle with the dual life, the one they desired and the one that was inflicted on them by the necessity of their infant to be in the NICU. Consequently, many couples stated

that they felt tired and burnt out from the responsibility of their infants. They hoped to be relieved from this burden, as reported by John and Farida.

> *John: I am like someone carrying 400 kg … I cannot carry any more, I am overloaded… I am looking forward to my infants being sent home (FG9 P, Hosp. B)*
>
> *Farida: I have just delivered and my wound hurts, and I am not used to the sleepless nights … I surely would like and wish to be here every day, but I am not capable of it… (FG6 P, Hosp. B)*

Parents reported individual/collective practical barriers, such as the physical condition of the infant/mother, living far and transportation costs, the parent's occupation and other responsibilities, but all the parents stressed the need for training and close supervision, as well as continuous education, gradual implementation and support from the nurses and doctors. These were considered key elements for the future implementation of massage.

In contrast to the parents, the HCPs and many of the nurses expressed their attitude towards the intervention, on different occasions within and across FGs, articulating their reluctance and unwillingness to commit to engaging the parents in the care.

> *Caren: No way, you will become overloaded… (FG 13 HCP, Hosp. A)*

Other barriers discussed by parents pertained to the NICU setting, such as visiting hours and limited space next to the infant, inability to enter the NICU during the morning and afternoon rounds of the doctors and nurses, and the need to be encouraged and assisted by the HCPs as reported in subtheme 3.5. In general, the parents reported that they did not feel at ease coming and staying for a long time in the NICU. In contrast, the HCPs had concerns relating mainly to time constraints, staff resistance, improper implementation by parents, workload, entry to the NICU, and space availability. The majority highlighted the need to increase the number of staff. For instance, many nurses demonstrated a resistance to involving parents in NICU care, and rather than having the parents do it, some showed an interest in applying the massage themselves.

Reflection from my observational field notes from Hospital B:

On my second visit, while leaving the unit after my observation that day, I passed by the nurses' station; it was busy and full of residents who were busy writing on the charts or chatting, and the clerk was on the phone and asked: "Who wants to talk to the mother of Baby Y?" There was some time till one accepted to talk on the phone. I went several times for observation afterward. Every time I stayed for around 2-3 hours and during my observation, few parents came in and none of the nurses gave any teaching to parents and very few parents were assisted by HCPs.

6.2.4 Theme 4 Strategies to facilitate future implementation

6.2.4.1 Subtheme 4.1 Contextual and organizational factors

The HCPs and parents suggested different contextual and organizational strategies to facilitate future implementation of massage. The HCPs discussed concerns related to modifying their workload, recruiting extra staff and administrative support, as well as staff education and preparedness, integrating the massage into the routine practice, as well as establishing protocol and guidelines for monitoring and evaluation. In contrast, parents focused mainly on the need for flexible entry to the NICU, space availability and privacy, being well received and empowered, in addition to parental education, gradual implementation, and professional support to achieve optimal preparedness.

Only three parents out of 22 considered massage to be easily implementable. One parent explained that the doctors and nurses should introduce the idea of infant massage upon admission. The HCPs more often than the parents agreed that massage as a technique is easy to implement on preterm infants in the NICU; however before infant massage application, parents need to witness at least one demonstration and close monitoring by the nurse for the first few times thereafter.

John: The doctor can put massage as a routine application; you need a doctor's order which tells the parents: "You should caress your infants every day" ...to grow (FG 9 P, Hosp. B)

Similarly, the HCPs emphasized the importance of having a written order to integrate massage into the daily care.

Sanaa: it needs a medical order and will become as part of our work… (FG 5 HCP, Hosp.C)

6.2.4.2 Subtheme 4.2 Individual/collective factors

In this subtheme, both the HCPs and parents expressed that they favored and embraced the idea of infant massage. Couples wanted to attend the FG on massage together to grasp the idea and to have a role in the care of their infant. In general, fathers, mothers-in-law and grandmothers were willing to learn the technique of infant massage in order to help the mother. They were willing to come on a daily basis and be involved in the massage for the infant's welfare. This corroborates the notion that massage is embraced by the Lebanese culture. Being encouraged and assisted by the doctors and nurses and having the opportunity to be in the NICU were discussed as important facilitators by the majority of parents.

John: … Last time, she [the nurse] told me: "Bring a chair and sit near him." If I hear this from every nurse or the doctor...You should sit near your infant every day and caress him for hours… (FG 9 P, Hosp. B)

Zeina: The role of the nurses is to facilitate the application of massage … (FG 13 HCP, Hosp. A)

Having the willingness to commit and engage parents, taking ownership of massage as a positive intervention, and shared decision making were among the most important facilitators that were discussed among the parents and HCPs to promote future implementation. HCPs visualized allocating more human resources, having a dedicated, committed staff and supportive administration, and providing training for nurses as important factors for

successful future implementation. They also believed in providing information and skills for parents in support of their gradual application, on condition however, that there were no sick infants in the NICU so that the mother wouldn't be disturbed by seeing other infants who were at risk.

6.3 Conclusion

What emerged from the FGs was a conceptual framework that provided a generic account of how parents and HCPs constructed their understanding of the detail of the intervention, the value attributed to future infant massage implementation in the NICU and the perception of risks, potential barriers and facilitators through conceptual themes and subthemes. The HCPs and parents developed their understanding through their interactions with each other and with the environment they operated in as reflected in the observation notes. Although some findings from the two groups seem to resonate, however, there was an apparent lack of understanding each other's concerns particularly in relation to the parents' needs and concerns. Contextual differences such as BFH status and how this will affect the perception of HCPs for implementation was apparent in the different hospitals. The differences between the perceptions and attitudes of parents and HCPs regarding the application of massage in the NICU were highlighted (for example, staff in hospital A showed more commitment and willingness to apply massage than B and C). Yet, some similarities, as well, were clarified during the process; such as work overload and time constraints. In making the comparison to look for differences between the two groups the similarities also became clear.

The majority of the Lebanese parents and HCPs who took part in this study emphasized that the idea was culturally acceptable and not totally new to them. These positive perceptions are embodied in the cultural norms as revealed by the familiarity and acceptance of the intergenerational practice of massage on full term infants. Throughout the participants' accounts, there was evidence and acknowledgement that massage enhances the

growth and development of the infants. The majority of respondents identified that massage also facilitates parent-child interaction, affective bonding, and could prepare parents for the infant's discharge.

However, the findings from the majority of the participants in the three hospitals confirmed that despite the interest in implementing the massage intervention in general, the parents' participation in the NICU is currently almost absent except for breastfeeding. These conditions are highly influenced by the HCPs' and parents' cultural beliefs and the NICU contextual and organizational factors. Many parents expressed their inability to play the role of caregiver out of fear of harming their infants. The HCPs perceived infant care in the NICU as more their responsibility as HCPs. Consequently, the nurses' narratives supported the parents' claims and provided an explanation of the factors that interfered with their ability to support parents more completely and deliver such an intervention on a routine basis.

Parents identified cultural, contextual and organizational barriers, as well as individual and collective ones; for instance, transportation difficulties, living far from the NICU, the physical condition of the mother/infant, household obligations, unavailability of helpful staff, and the fear of transmission of infection. On the other hand, the HCPs highlighted staff attitude and resistance, workload and time constraints among other barriers that related to them directly as well as to the NICU context and the organization. All three hospitals lack a general structured infant care discharge teaching program for parents and do not include any information about infant massage in specific. Communication, gradual implementation, encouragement and support were major facilitators identified by parents for sustainable implementation. In comparison, having extra staff and a protocol for teaching nurses and training parents, commitment to practice, clinical integration, openness and adoption of innovation were mainly identified by the HCPs. In addition, the baby friendliness status as reported in hospital A explains the greater interplay between the cultural and contextual factors that might influence the future implementation processes of infant massage in Lebanese NICUs from the HCPs' and parents' perspectives (RQs 4 and 5). This chapter

answered research questions 4 and 5 from the HCPs' and parents' perspectives as well as a synthesized difference of the two groups.

Findings presented in the last three chapters will be further discussed in chapter seven. They will serve to identify the similarities and differences to gain a greater understanding of the Lebanese cultural, contextual and practical processes that might inhibit or facilitate the application of infant massage in the NICU in order to address the gaps in the current system in Lebanon.

CHAPTER 7 : DISCUSSION

7.1 Chapter overview

The findings presented in the previous three chapters have facilitated an in-depth exploration of the value HCPs and parents attribute to the potential implementation of MPM for infants in the NICU as well as revealing the barriers and facilitators for parental participation. Gaining this understanding helps clarify the extent of parent and HCP readiness to undertake MPM as a routine intervention.

This chapter provides a critical analysis and evaluation of the implications of the overall thesis findings delving into the complexity of potential implementation of MPM in the NICU. First the research questions are revisited. Second a model is presented that explicates the findings as they relate to the four constructs of the NPT and the RQs. Then a critical evaluation is made of the key findings in reference to the RQs and the literature. Lastly the appropriateness of NPT as the theoretical framework is critiqued.

7.2 Revisiting the Research Questions

The purpose of this section is to assess whether the research questions were answered. The initial aims of this thesis were to review the evidence concerning the effect of MPM intervention on outcomes for preterm/LBW infants and subsequently to explore the parents' and HCPs' perceptions and attitudes concerning the factors that affect parent-implemented MPM in the NICUs.

The following questions were initially posed:

1. What is the evidence of the effects of infant massage on preterm and/or LBW infants?
2. What are the mechanisms of action and underlying theories regarding infant massage?

3. What are the facilitators and barriers in relation to the context when implementing massage techniques on preterm and/or LBW infants in the NICU?

In an attempt to gain a clearer understanding of the topic, two reviews were conducted (Chapter 2). The first was a scoping review of systematic reviews of RCTs to summarize the results of any systematic review conducted between the years 2000 and 2010 for the effects of MPM on the infants' physiological, behavioural and psychosocial health as well as breastfeeding and parent-infant interaction in the NICU. One Cochrane review by Vickers's et al. (2004) was found. It reported that preterm infant massage improved daily weight gain and a reduction in LOS for clinically stable massaged infants in hospital settings. The gaps identified in the scoping review prompted the systematic integrative review to further identify the barriers and facilitators to the implementation of infant massage in the NICU.

The second integrative review yielded 16 RCTs focused mostly on the short-term physiological and psychological effects of MPM on the infants and mothers. The review revealed a growing body of evidence for the positive effects of massage on infant growth and development and mother-infant interaction. The review suggested that MPM is a potentially helpful intervention. However, the exact mechanisms of action have not yet been confirmed and further research is still needed. Important process outcomes that can facilitate or limit the implementation of this technique and other factors related to the perception and attitudes of parents and HCPs in this regard were not elaborated in the literature (see chapter two). This gap of evidence on the contextual issues that can facilitate or impede the implementation of massage in the NICU became obvious. The reviews did not answer the question concerning the contextual facilitators and barriers when implementing MPM. Moreover, no empirical qualitative studies focused on infant massage implementation in the NICU were found in the literature. Hence this study was done to fill this gap.

An exploratory qualitative investigation was conducted in an effort to answer the gap in research relative to the third question. The study was underpinned by the NPT as a sensitizing framework (see chapter three). It aimed to explore parents' and HCPs' perceptions

and attitudes concerning the factors that might affect parent-implemented infant massage in the NICUs. To address this aim the following research questions were asked:

1. What are the parents' perceptions and attitudes towards massage as a potential culturally acceptable form of intervention provided by them in the NICU to improve the outcome of their stable preterm infants?
2. What are the perceptions and attitudes of HCPs concerning massage as a potential culturally acceptable intervention provided by parents in the NICU for stable preterm infants?
3. What are the cultural, contextual and organisational processes that might hinder or facilitate the application of infant massage in the NICU from the HCPs' and parents' points of view?
4. What are the similarities and differences between HCPs' and parents' perceptions and attitudes regarding massage application in the NICU?
5. What is the interplay between the cultural and contextual factors that might influence future implementation processes for infant massage in a Lebanese context?

In order to answer questions 1, 2, and 3 exploring the perception of the benefits and risks of massage, perceived barriers and facilitators, and strategies to facilitate future parent-implemented infant MPM, focus groups with parents and HCPs as well as observation of the NICU environment were undertaken. Despite the participants' interest in implementing MPM intervention, the NICU is not ready for parents to routinely participate in infant massage due to contextual and practical processes that might inhibit or facilitate its application. These findings also assisted in answering the last two questions (4 and 5) relative to the similarities and differences between the perceptions and attitudes of parents and HCPs. In addition, a critical comparative analysis of the interplay between the cultural and contextual factors was carried out (chapter 6). Parents identified cultural, contextual and organizational barriers, as well as individual barriers, while the HCPs highlighted staff

attitude and resistance, workload and time constraints. The next section will address the nature of this agreement/disagreement between parents and HCPs and consider the findings in relation to other literature (section 7.8).

7.3 Explanatory Study Model of the Anticipatory Processes that Might Inhibit or Promote Parent-Implemented Infant MPM in the NICU

To further identify the similarities and differences between the HCPs' and parents' perceptions and attitudes towards parent-implemented infant MPM in the NICU, an explanatory study model was created illuminating the potential for future infant massage implementation by parents in the NICU (Figure 7.1). This model serves to highlight the four NPT constructs as they relate to the themes and subthemes that emerged from analysis of the data. The findings depicted in relation to the NPT are attached to them with the NPT in the middle. This visual conceptualization was then divided into driving forces on the righthand side detailing themes and subthemes that could promote implementation. The lefthand side then details the restraining forces that could hinder implementation.

By creating this model, I reflected with a holistic view on the main interactions and relationships of the actors and key factors arising from the data with reference to the research questions and the four constructs of the NPT model. The elements of the model and the relationship of each element to the others, illustrates that each construct of the model is co-dependent on the others.

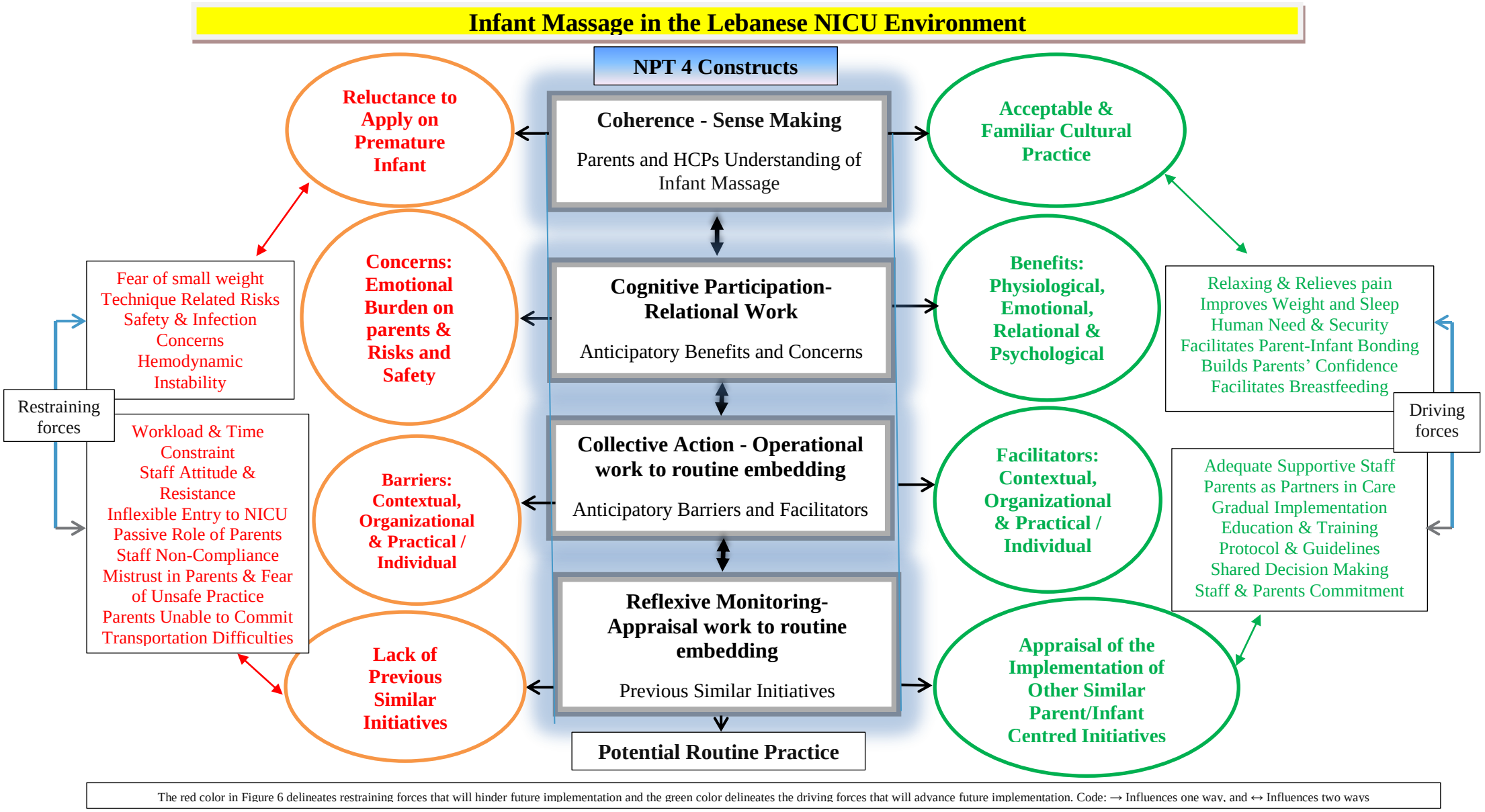

Figure 7.1: Explanatory Study Model of Parents' and HCPs' Understanding of the Anticipatory Processes that Might Inhibit or Promote Future Infant Massage Implementation by Parents in the NICU (NPT adapted Model)

This model (Figure 7.1) was a tool that arose from the data and guided the discussion of the findings of this study. It captured the parents' and HCPs' sense making and understanding of MPM as an intervention. The degree of potential engagement - cognitive participation- was revealed by the participants' perception of benefits and risks and what it meant to them based on past experience and how it related to their current work. Multiple barriers and facilitators to implementation have also been identified pertaining to the potential cultural, practical, contextual and organizational barriers and facilitators for future massage implementation in the NICU utilizing the full range of constructs within the NPT.

7.4 Critical evaluation of the key findings in reference to the literature and the NPT answering the RQs

This section is structured around my findings and how they answer the research questions. The findings are linked to the four NPT constructs: coherence, cognitive participation, collective action and reflexive monitoring as they relate and assist in processing the findings. These findings are also linked with the relevant literature. The value Lebanese HCPs and parents attribute to infant massage as an intervention in the NICU and its implementation is determined by a complex interaction between cultural, organizational and contextual factors. This reflects much of what has been published about other touch-based interventions such as KMC (Blomqvist, Frölund, Rubertsson, & Nyqvist, 2013). For instance a balanced staff workload, commitment to practice, training and support, and openness in the adoption of innovation can support the future application of MPM in a Lebanese NICU environment. From this study's findings, the parents' participation in the NICU depends on both the physical environment of the NICU and the perceptions and attitudes of the HCPs towards supporting parents in the process of becoming partners in their infant's care.

MPM has been suggested by neonatal experts as a means to promote sensory development and deliver positive touch (Bond, 2002; Field, 2014) as compared to other touch-based interventions. Evidence has been mounting in the last three decades that likens MPM with other methods of positive touch as an equally beneficial intervention (Bond, 2002; Field, 2014; Stack, 2008) for example KMC with the mother or SSC extending to the greater family (Feldman, Singer & Zagoory, 2010; O'Brien, 2004). Although KMC and SSC are different interventions than massage, there are similarities that can benefit our understanding. The similarities include the touch, emotional contact and physical proximity of the mother to the child (Metgud & Honap, 2015; Juneau et al., 2015). Based on these similarities, the discussion of the findings of this thesis take into account the international literature focusing on facilitators and barriers of other touch-based interventions in the NICU to answer the research questions.

Studies of other touch-based interventions such as KMC and SSC are extensive and go back 30 years (Conde-Agudelo & Diaz-Rossello, 2016) and the practice, mainly from resource-limited settings, has become evidence-based (Conde-Agudelo & Diaz-Rossello, 2016) (refer to chapter one, section 1.6.2). Moreover, there is acknowledgement among scholars in the field of KMC (e.g.: Blomqvist & Nyqvist, 2011; Blomqvist et al., 2013) that studies of a qualitative nature are needed in addition to quantitative studies to successfully further explore the perception of parents and HCPs toward a sustainable implementation for LBW infants. The information of these studies enriched my understanding so I was better able to compare and contrast my findings of parents' and HCPs' views with other touch-based intervention studies.

Bergh and Pattinson (2003) followed a qualitative approach aimed at mapping different processes and various alternatives in the practice of KMC. In their study, they conducted interviews and on-site observation. This approach enabled them to develop a tool which captured the essence of important management issues in the implementation

of KMC at an institutional level. Important management issues in the process of taking decisions on whether and how to introduce KMC in the NICU were highlighted such as: "institutional structure" i.e. interpersonal relations, communication and professionalism; "management issues" i.e. staff shortages and finance; "infrastructure" i.e. space available and physical structure; and "people issues" i.e. motivation and resistance to change, all mirroring the findings of my study.

Although the idea of infant massage is becoming accepted in many NICUs worldwide, the translation into specific policies and practices varies within and between countries, it is mostly applied by nurses (chapter two). It is worth noting that MPM is non-existent in Lebanese NICUs except for the quasi-experiment that was conducted by the author of this thesis (Abdallah et al., 2013).

In this study, the issues to be considered include the HCP workload and time constraints, staff education and training, staff attitude and resistance to change, inflexible entry to the NICU, the passive role of parents, the HCP's fear of the parents' non-compliance, the HCPs' mistrust of parents, fear of unsafe practices, difficulties in transportation, and the parents' inability to commit (Figure 7.1).

7.4.1 Parents' and HCPs' perceptions of attitudes towards massage relative to the NPT construct of coherence

During analysis, many themes emerged from the data and answered the RQs 1, 2 and 4 explaining and comparing the views of both HCPs and parents as detailed in section 7.2.

As reported by this study, massage is culturally valued particularly by the elders. The idea of massage is acceptable and coherent as it is considered by most parents and HCPs as a vital part of the Lebanese intergenerational tradition. This also reflects the intergenerational practice in the villages as part of the social support that has existed in

the extended family within the Lebanese culture (Dubar & Nasr, 1976). This assists in answering RQs 1 and 2.

It appears that infant massage is an important part of the infant nurturing process as it is culturally known to relieve colic and enhance sleep allowing grandmothers and mothers-in-law to participate in the care of the full term infant. It was apparent across FG discussions that massage was a culturally familiar act (see Figure 7.1). It can be concluded from the participants' accounts that many parents in Lebanon do massage their full-term babies after a bath; rubbing the baby's head, shoulders, hands and legs with olive oil and doing "Swedish-like exercises" as an old practice from the villages, or with baby oil after a bath as a common practice nowadays. This can be seen in oil promotion at the hospitals and through the channels of media on TV.

In the Lebanese context, referring to infant massage as an intergenerational practice supports the findings of other studies. Mothers in several cultures massage their healthy term infants for a number of months as an integral part of parenting. For example, a survey conducted in Bangladesh found that 96% of mothers give their babies a whole body massage between one and three times daily (Darmstadt & Saha, 2002). In Western India, mothers massage their full term infants because they believe it enhances circulation and promotes strong bones (Blackwell, 2000). In India, massage is usually done with oil and kinaesthetic stimulation. It is a ritual and done directly after birth and before bath on a daily basis as it is also believed to be associated with better muscle formation and weight gain (Kumar et al., 2012).

However, the MPM shown to parents in the video for preterm infants was considered somehow different from the traditional massage and a new act since preterm infants are considered fragile. Parents were interested in the idea, but were concerned about the low weight of the infant. As for HCPs, the act was acceptable to the majority of them and they tended to reflect on the biophysical benefits when applied within the

NICU norms. The main reason for accepting the idea of preterm massage as mentioned in the HCP FGs is that MPM is easy to implement as it is compared to infant oil application in the NICU. Specifically, HCPs in Hospital A FBFH, had a more positive perception of the act than the other hospitals. They identified MPM as something familiar and very similar to what nurses do as an oil application (RQ 2). However, reluctance to apply MPM on preterm infants in the NICU was observed in hospitals B and C. Therefore, findings of this study indicate that the meaning parents and HCPs attribute to massage practice in some settings makes the implementation less likely and constitutes a core factor for potential future implementation in Lebanon.

The majority of HCPs and parents who participated in the study reported that MPM was a familiar and acceptable act and could be an appropriate intervention (section 6.2.1). A few were reluctant out of fear for the fragile infant. Also this was a new concept for parents and HCPs in the care for premature infants as opposed to term infants. This consensus provided an indicator that the parents' and HCPs' perceptions of infant massage, in general, whether familiar or acceptable, reflect that they profoundly understand the need of infants to receive massage. HCPs and parents also expressed awareness of the parental need to touch their infants. Gender and educational differences were not an issue relative to this perspective. However, the older generation, specifically family members from areas of Lebanon with a strong tradition of olive oil production, appreciated this cultural practice and exhibited a greater willingness to apply massage as part of an NICU practice demonstrating coherence.

The findings of this study infer the positive perceptions and attitudes of parents and HCPs regarding parent-implemented infant massage as a culturally acceptable form of intervention to improve the outcome for the stable preterm infant.

7.4.2 Perception of Benefits and Risks relative to the NPT construct of cognitive participation

Defining the benefits and risks of infant massage in the NICU constitutes a crucial indicator for the willingness or reluctance to engage in infant massage in the NICU (RQs 1 and 2). Weighing risks and benefits while considering the preterm infant as 'fragile'; parents expressed their concerns and the need for monitoring, support and supervision by HCPs in the NICU setting (RQs 1 and 2).

This section highlights the similarities and differences of HCPs' and parents' views acknowledging the potential benefits of massage for the infant and the caregiver. This was obvious throughout the accounts, as there was evidence and acknowledgement from both HCPs and parents that massage is a compassionate type of care. Additionally, MPM was thought to have emotional, psychological, relational and physical benefits for the infant and provides emotional fulfilment to the care provider as well (Table 6.1). Parents in particular expressed a strong desire to touch their infant as a human need for both of them. They strongly believe that their child needs to feel the parental touch and presence. However, they articulated various concerns relative to the fears and anxieties of potential risk and safety issues. Therefore, any proposed neonatal massage intervention would need to tackle these emotional issues and security risks. These findings are supported by the meta-synthesis of 10 qualitative studies reviewed by Swartz (2005) that focused on the importance of parental use of touch relative to fear and anxiety towards protecting the fragile state and cautiously affirming the healthy future of the infant. Also a dissertation by Whittington (2010) designed to gain a better understanding of the emotional responses of parents before, during, and following touching their infant revealed similar findings of fear and anxiety. Whittington therefore stressed the importance of parental emotional support and preparation by HCPs.

Although parents who took part in the study had a positive attitude towards massage, it was not enough in itself to enable future implementation since it should be coupled with support for this action by the different stakeholders and the hospital administration. The findings of this thesis support the theoretical buy-in to infant massage by parents and HCPs. However, weighing costs and benefits were two opposing forces demonstrating cognitive participation that reflected duality in the perception of infant massage as a potential intervention by parents in the NICU (Figure 7.1).

7.4.2.1 Perception of emotional, Psychological, and Relational Benefits

From the findings revealed through this study it can be inferred that the significance that HCPs attribute to infant massage constitutes a major positive factor for future implementation. For instance, many HCPs perceived that infants in the NICU might have a fear of being left alone and that positive touch such as MPM as an intervention by parents might give infants a sense of security and foster positive responsiveness. Although a few HCPs commented that they did not understand the importance of this touch between the parent and their infant, they later supported the validity of the action with anecdotes in the FGs (refer to chapter 5 subtheme 2.1).

In this study HCPs and parents agreed on the need for positive touch stimulation as a fundamental need in facilitating bonding, breastfeeding and in preparing parents for discharge. Moreover, parents and HCPs in all FGs acknowledged that massage is relaxing and rewarding to both the infant and the caregiver carrying out the act improving infant quality of sleep, facilitating parent-infant attachment and/or the nurse-infant relationship, building the parents' confidence and facilitating breastfeeding. These were obviously independent thoughts since the video had no sound as it was in English and would not be understood by the audience. Several HCPs and parents

alluded to the benefits of massage particularly for breastfeeding. For instance, one parent said that touch and massage by the mother will bring the milk forward with a "let down reflex" (Aziza, GM, FG 11). In support of this finding, a trial by Feldman and Eidelman (2003) measured the associations between touch and breast milk uptake with more frequent maternal affectionate touch scoring the highest cognitive development. The study reported positive results between consumption of maternal breast milk and infant neurodevelopment, improved maternal mood and interactive behaviours.

Moreover, the findings of a recent descriptive study in the U.S., outside the parameters of my review which only captured up to 2012, exploring neonatal nurses' attitudes regarding the use of MPM for preterm infants in the NICU has indicated strong positive attitudes regarding benefits, and very minor negative attitudes regarding concerns and issues with promoting MPM. The nurses' support was correlated to age, experience in nursing, and specifically experience in NICU nursing (Jambulingam, 2016). As Lebanon has a high-tech medical industry fairly similar to the U.S., this is another indicator for potential future implementation of MPM. This information is helpful for designing an intervention whereby nurses with a greater education and experience would be more willing to facilitate the implementation of the MPM.

The relationship between mothers and nurses has a critical impact on how mothers perceive their role with their infants. It has potential to build their confidence from a silent to an advocacy role which can support early parenting in the NICU and promote healthy attachment (Aagaard & Hall, 2008; Fenwick, Barclay, & Schmied, 2008). According to these authors, their findings indicate that opportunities should be created to allow the mothers to touch their infants and to interact with and gaze on them as soon as possible after delivery in order to establish the mother-infant bond and to aid in the oxytocin hormone release which is known as the love and bonding hormone or

anti-stress hormone (Okabe, Yoshida, Takayanagi, & Onaka, 2015; Galbally et al., 2011; Uvnas-Moberg, 2003).

HCPs in the study identified that involving parents in infant massage is one way to prepare parents and encourage them to touch their infants demonstrating collective action as the third construct of the NPT. This in turn will improve their knowledge about infant cues, how to communicate and interact with their infant and how to recognize signs of stress. Nurses can support the attachment in the mother-infant dyad in the NICU by encouraging this maternal contact (Kearvell & Grant, 2010). Those nurses who provided psychosocial support, communicated and engaged with mothers were found to assist in developing positive and trustful relationships. This significantly diminished the mother's anxiety and enhanced her confidence when interacting with her baby. Fathers more than mothers in this study expressed that they felt MPM would be easy to learn and showed a readiness to apply it, if well supported by HCPs and their infant was in a sufficiently stable condition. In support of this finding, a recent exploratory case study of fathers who massaged their infants was made by Keller (2013). Keller found that doing massage was enjoyable and these fathers believed that their infants enjoyed being massaged as well. This made them more competent and confident in their interactions with their infants and provided temporary relief for the mothers (Keller, 2013). In another study, fathers described touch experiences as a part of getting to know their infant in the NICU (Pohlman, 2009).

In general, when parents are supported in the NICU they assume a better sense of control and self-confidence which also helps to decrease the mothers' post-partum stress (Chertok, McCrone, Parker, & Leslie, 2014). Additionally, preterm infants who were visited and cuddled in the NICU by their caregivers had an improved quality of movement, less stress, less arousal and less excitability in their early neuro-behavioural state by term equivalent (Reynolds et al., 2013). As evidenced, NICUs need to

encourage attachment by allowing parents to participate in their child‘s care, including the facilitation of MPM (Lappin, 2005).

In the same vein, a systematic review to identify effective interventions for communicating and supporting parents in the NICU indicated that creating opportunities for parents such as breastfeeding, KMC, massage and thorough discharge planning reduced the parents’ stress and depression (Brett, Staniszewska, Newburn, Jones, & Taylor, 2011). This was also reflected by the Hall et al. (2015) review findings that highlighted the importance of providing psychological care and support to parents. Significantly, the authors emphasized that touch-based interventions including massage are equal in importance to medical care to support parents and the development of the infant in the NICU.

7.4.2.2 Perception of physical benefits and other benefits

The study findings suggested that the more educated and experienced the staff, the more they were aware and articulated the physiological benefits of infant massage such as relaxing, relieving pain and colic, promoting blood circulation, sleep, growth and decreasing stress. This demonstrates that there was an awareness/understanding and acceptance of the importance of this act, particularly by the upper management (junior specialists, HNs and consultants). Participants in both groups, parents and HCPs, highlighted their beliefs in the benefits of massage to both parents and infants demonstrating cognitive participation; the third construct of the NPT. However, despite the participants’ interest in implementing this intervention in general, the parents’ participation in the NICU is currently almost absent.

In general, both parents and HCPs hold the belief that massage is beneficial for the growth and development of their infants (RQs 1 and 2). Numerous parents in this study agreed that their presence is fundamental and valuable because the baby can feel

these interactions and they can counter infant isolation, pain, and distress. Many HCPs cited other possible benefits of introducing infant massage; to them, to the infant and to the parent. However, parents were worried about the health of their small and fragile premature babies. Therefore, the issue of fear was notably identified as an impediment to the idea of MPM. It is evident that the potential risks of massage and fear emerge as the main barriers to its implementation; yet, the idea that if the parent is allowed to do MPM this will reassure parents that their infant is recovering and is medically stable.

Findings from the literature review in chapter two suggest that MPM has potential benefits for both the mother and infant, and that it might be suitable as a non-pharmacological intervention for stable infants in all NICUs. Studies included from the last few decades have provided growing evidence documenting positive infant and parental outcomes of MPM, particularly physiological concerning the growth and development of the infant. This growing body of evidence is important to influence beliefs, increase the confidence of HCPs and parents in the use of MPM and pave the way for future implementation. These physiological benefits, consistent throughout the literature, include: relaxation of muscles, relief from pain, better weight gain and development, better developed regulation of the physical state, alertness and responsiveness to the mother's voice and face and ease in feeding (Diego, Field, & Hernandez-Reif, 2014; Guzzetta et al., 2011; Abdallah et al., 2013; Reynolds et al., 2013; Badr et al., 2015; Pepino & Mezzacappa, 2015; Juneau et al., 2015; Álvarez et al., 2017; Niemi, 2017). For example, in a recent meta-analysis of RCTs and quasi experiments of infant MPM conducted by Badr et al. (2015), twenty-five studies assessed weight gain with 16 studies noting improved weight. However similar to the findings of the review in Chapter two, this review found that the studies on infant MPM that assessed weight gain, weight at discharge, caloric intake and LOS used different methods to assess weight gain as either total mean weight gain, daily mean weight gain

or providing total weight gain during the study period or during the NICU stay (Badr et al., 2015). Badr et al. (2015) found that six of the eight studies that used oil in the massage showed positive results (Arora et al., 2005; Darmstadt & Saha, 2011; Diego et al., 2014; Fallah, Karbasi, Golestan, & Fromandi, 2013; Kumar et al., 2013; Rangey & Sheth, 2014; Sankaranarayanan et al., 2005; Vaivre-Douret et al., 2009), indicating that when MPM is provided with oil, the positive gains in weight are more consistent. Although MPM showed positive results comforting the infant and enhancing weight gain and cognitive development, the high heterogeneity among studies weakened the evidence and highlights the need for further RCTs to increase the level of evidence.

A recent systematic review evaluating the effects of MPM on term and preterm infants was conducted by Juneau et al. (2015). The review argues that MPM should preferably be performed by a parent since many studies confirmed the additional effect of MPM on parental sensitivity and parent-infant interaction and bonding. The positive effect on weight gain is the same when infant MPM was administered by mothers or by nurses as reported by Juneau et al. (2015). However, weight at discharge, weight gain during NICU stay, caloric intake and LOS are highly confounded by GA and co-morbidities as limiting factors in terms of generalizing the results.

This growing body of evidence if disseminated to HCP and parents is likely to increase their confidence influencing their beliefs and feeling of certainty in the future implementation of MPM. However, future studies are necessary as the current evidence relative to the effectiveness of massage does not account for contextual factors that might facilitate or impede the implementation of this technique. These will be discussed in section 7.4.3 discussing the barriers and facilitators.

7.4.2.3 Perception of risks of MPM

The parents' and HCPs' perceptions concerning MPM risk for preterm infants were somewhat divergent (RQ 4). Parents in general, specifically first time parents, had concerns about MPM technique and safety, risk of infection, fear of small weight and the infant's physical state. The majority of parents reported their fear of having a baby in the NICU as they perceived him/her as small and fragile. As for HCPs, the safety issues discussed were mostly related to the physiological state of the infant, mistrust in the parents' abilities and fear of infection. They also added that many parents might hesitate to be involved and to apply such an intervention out of this fear of small weight, technique related risks, the amount of pressure used and safety issues.

These findings are consistent with the literature relative to the effects of the NICU environment on the parents where having a fragile baby in the NICU may generally cause them shock, guilt, helplessness and anxiety owing to the high-tech environment and the infant's condition (Turan, Başbakkal, & Özbek, 2008; Ardal, Sulman, & Fuller-Thomson, 2011). In a study by Hack (2009), infants who are repeatedly manipulated by intrusive medical actions causing discomfort or pain may have fluctuations in respiration, heart rate, and blood pressure that could potentially affect cerebral blood flow and predispose the infant to hypoxic ischemic injury. Hack's (2009) research might explain why parents are anxious about the negative consequences for infants of medical and nursing interventions in the NICU demonstrating the cause of parental concern from what they have seen through medical actions. However, the evidence from the IR (chapter 2) did not find any negative physiological side effects of MPM so parents can be reassured about the safety of this intervention. HCPs as well as parents agree that the greatest fear and hesitance is mostly in relation to safety and infection concerns as well as the hemodynamic instability of the infant. For instance, massage was suggested by several HCPs to be tailored to follow the specific infant's

cues. This finding highlights the potential importance of assessing the infant's readiness to receive the massage. It seems that the HCPs also want reassurance that parents will do no harm. These findings resonate with the Ferreira & Bergamasco (2010) and Vaivre-Douret et al. (2009) studies which revealed that the massage provided should be based on infant cues.

The findings of this study also support the same issues HCPs have wrestled with and that have been widely discussed in the KMC literature. Both focus on supporting parents and monitoring the infant's condition during the intervention as well as the safety and stability of the infant with major concerns of dislodgement of equipment and baby position (Chia et al., 2006; Véras & Traverso-Yépez, 2011; Bergh et al., 2013; 2014). There is a scarcity of studies on the perceptions of parents and HCPs toward massage in the NICU. Other literature that looked at maternal views about caring for or handling preterm/LBW infants highlighted similar stressors demonstrating cognitive participation; the third NPT construct (Whittington, 2010). They reported the parent's greatest fears include their infant's survival, modification of their role as parent, and separation due to hospitalization.

In Lebanon, there are no studies on the perception of HCPs or parents of premature infants in the NICU. In addition, research on the psychosocial dimension of infants in the NICU remains under-investigated. Only one study, to the author's knowledge, has been conducted as part of a master's degree in nursing at St. Joseph University (Ayala, 1999) in Lebanon. The aim was to identify the mothers' experiences of the premature infants' NICU hospitalization at Sacre-Cœur Hospital - Lebanon. According to the results of this study, several feelings were expressed by these mothers: feelings of fear, sorrow, shock, frustration, guilt and worthlessness. Several other reactions have also been identified: sadness, stress, denial and refusal of the hospitalization. The most difficult periods were experienced directly before delivery,

the time of the first visit to the infant in NICU and upon their return home. Along the same line of investigation, a phenomenological-hermeneutic study of eight mothers' narratives by Nystrom and Axelsson (2002) in Sweden revealed that mothers feel like outsiders and report a lack of control over their infants in the NICU following separation from their infants. This is confirmed by the parents' accounts in this study who expressed fear of the strange environment as well as having a passive role in the NICU. However, these studies were limited to the mothers' experience without including the fathers who tend to be greatly concerned by this situation. Lundqvist et al. (2007) also conducted a qualitative study in Sweden to examine the fathers' perspectives of caring for preterm infants, and documented that they felt that the NICU environment was a major barrier for the bonding process.

Two types of parents were identified in chapter four under theme 4 (4.2.5.2): the first type was afraid of the NICU environment and the tubes connected to their baby. They feared touching the premature infant as they perceived him/her to be fragile and small; they preferred to observe him/her from a distance. The second type was more receptive and ready to learn. Although in general parents showed interest in massage intervention, within both groups of parents there were contradictory thoughts about the actual massage application in the NICU. Both had concerns about its safety as they were afraid to cause harm to their baby. For instance, all parents had concerns about their baby contracting infection. One father was afraid about the condition of his premature babies and consequently the appropriateness of massage as he perceived his premature babies to be fragile and delicate (Charlie, FG 10 P, Hosp. B). He was worried that the nurse or his wife would make a mistake in handling the baby. Therefore, the infant's medical needs were perceived as the highest priority and psychosocial emotional needs and comfort were secondary. Another participant (mother) said that although massage comforts the baby, she thinks it needs time to be applied; it should

not be forced on parents as some of them might not be competent enough to do it. It is evident from these findings that there is a need for the intervention to be discussed with parents before implementation, and for gradual preparation and training by the health care providers so that parents will understand the process and get used to the idea since it would be a new concept for them. However, Lebanon is still far behind Sweden as Sweden practises FCC and are more advanced in holistic care.

Nevertheless, findings from the parents' FGs revealed that if given time, they felt they would overcome their fear and be better able to interact and care for their baby. This indicated a readiness of some parents to take part in the daily care and apply MPM, though conditional on individualized support and staff encouragement. These findings concur with earlier research about the parents' mixed feelings. Paradoxically, parents want to take care of their child, yet they feel initially afraid because of the infant's small size and being dependent on life support technology. However, with time and more interaction and encouragement from nurses, parents feel more confident about their provision of care (Bernaix et al., 2006; Martínez, Fonseca, & Scochi, 2007; Aagaard & Hall, 2008; Nyqvist & Engvall, 2009; Sawyer et al., 2013). This denotes that the mother-infant attachment process for infants in the NICU is facilitated by mother-nurse interactions (Jones, Woodhouse, & Rowe, 2007).

As revealed by this study, on the one hand, many parents expressed their fear and anxiety of touching their baby. HCPs perceived infant care in the NICU as their responsibility. Generally, nurses are in charge and feel the responsibility of caring for the NICU preterm infants. As such, the majority of HCPs perceived parents as passive observers and unable to perform the role of caregiver mainly out of fear of causing harm. On the other hand, massage was perceived by both parents and HCPs as a means to connect with the infants and provide positive touch to counter intrusive or painful

procedures. This answered the question relating to the similarities and differences between parents and HCPs' perceptions demonstrating cognitive participation (RQ 4).

7.4.3 Barriers and Facilitators to engage in the practice of infant massage in the NICU relative to the NPT construct of collective action

Several themes emerged from the data that answer RQs 3 and 5 by explaining the cultural, contextual and organisational processes, as well as their interplay that might hinder or facilitate the application of infant massage in the NICU (section 7.2).

7.4.3.1 Barriers

The lack of resources including staff shortage and time constraints, and presence of sick infants in the NICU are key factors for the inability of staff to dedicate time for the parents' education and training. In addition, the majority of the parents and HCPs highlighted the incongruence between the available resources and the desired skills of parents and HCPs. Nurses seem to adjust their work with the preterm infant around the doctors' rounds and schedules and not around the infant's and families' needs demonstrating a lack of collective action as they carry out their duties; the third construct of NPT demonstrating facilitators and barriers. This difficulty which makes implementation less likely could also provide an explanation for why HCPs perceive the NICU as only servicing acute care. In fact it should be seen as a womb for infants and a home for families (O'Brien, 2004). The complex interplay of contextual and cultural factors in the NICU and how participants perceive and respond to the barriers to parent-implemented MPM is apparent.

Parental concerns regarding massage implementation included participants' experiences as parents of a premature infant i.e. everyday life, challenges to visit and to enter the NICU, separation, and breastfeeding. In this study, the idea that parents can

have a participatory role in the NICU was somehow new which represents a significant barrier for the parents' participation. For some nurses, the idea of parents sharing this responsibility in the care even constituted a threat and an attempt to overturn the balance of power in favour of the parents.

Participating HCPs confirmed that they are usually the primary caregivers covering the responsibility for infant care "from A to Z" (Doris, FG3, Hosp. B). Several HCPs complained that parents ask too many questions and as they have limited time and are overloaded they cannot accommodate parents in the NICU care. The issue of possessiveness by HCPs is corroborated by the parents' accounts and confirmed through the observation. This issue was also discussed by Kenner and McGrath (2004) relative to change in authority between nurses and parents and the uncomfortable feelings among staff. Expert neonatal nurses articulated their feelings of loss for the role that they previously held before parents became more empowered.

HCPs considered the workload too overwhelming to broadly introduce infant massage as an intervention to be carried out by parents which demonstrates their collective action; the third NPT construct. Only a few nurses showed their misperception of why they needed to introduce this change in the NICU and disrupt the status quo. Already being burned-out by the extra load in hospital B, the NBFH, was clear from the HCP's accounts relative to the introduction of TPN preparation on the unit. This notion of excessive workload was also discussed by Alharbi, Carlström, Ekman and Olsson (2014 p. 107) who concluded that HCPs, in general, have the tendency to reinforce the status quo rather than embrace change.

The NICU staff's perception of the parents' ability was a major hindering factor. Nurses repeated their concerns about balancing between their daily defined responsibilities in the NICU and their ability to meet the needs and concerns of parents. This is corroborated by the findings of Gallagher et al. (2012) and Obeidat et al. (2009)

detailing the difficulties that neonatal nurses face mainly in the U.S. and Europe. Often, maintaining their professionally defined roles in the NICU while meeting parental needs and concerns is challenging for them. In the research of this thesis, nurses had assumptions about the parents' abilities and role, yet these did not appear to reflect a deep understanding of the psychological needs of the family. More studies are needed to explore the depth of the nurses' understanding of parents' needs and how to increase their empathy.

In contrast, the parents' perception of their NICU experience focused on the lack of staff encouragement and their inadequate preparation for MPM in view of staff shortage and workload (Figure 7.1). It seems that parents believe that the NICU context has many organizational factors that hinder their participation in the daily care and limits the time available for them to discuss their emotions and concerns. The foundation of this belief demonstrates a lack in collective action on the part of HCPs. Parents claim that the staff does not allow them to come in due to other engagements and the nurses' time constraints, especially when there is a sick baby or during rounds. This implies that the NICU physical structure, staff workload and restricted visiting hours hinder the implementation. This was observed in research for both FCC and KMC (Blomqvist et al., 2013; Smith, Swallow, & Coyne, 2015; Foster, Whitehead, & Maybee, 2016). These cited findings support the same implementation issues as those for KMC identified by Blomqvist et al. (2013) in Sweden such as staff work overload, lack of training, not having clear protocols, insufficient parent-HCP communication and commitment. Providers and parents have been struggling with these inadequacies since the early 1990s which are still unresolved in the NICU in many countries, even in the West. Although embracing the importance of touch and massage, the majority of HCPs debated the limitations encountered by their lack of preparedness. When discussing the

application, nurses were resistant due to time constraints, space availability and overload.

The distinction between views shows that parents and HCPs do not understand each other's role in its entirety. In the Lebanese culture and educational system, the HCPs are trained as the sole decision makers and caregivers in contact with the infant. This traditional care ideal makes it difficult for them to include parents in the care and decision making process, and for parents to become active decision makers and partners in the care of their infant. This answers RQ 4 detailing the differences in perception between HCPs and parents in relation to setting the priorities of the infants' and parents' needs.

Illustrating the issue with barriers, a survey in Australia with 34 neonatal nurses working in the NICU followed by in-depth interviews on the use of KC and promoting its use in the NICU suggested that although the majority of nurses reported positive attitudes, they identified specific concerns. They explained that heavy staff workload, insufficient education, lack of organisational support and the absence of clear protocols need to be addressed to ensure a touch based intervention such as KC with LBW infants is safe and effective (Chia et al., 2006).

Further to these issues, in this study some nurses had a lack of trust in the parents' ability to perform their duties. Some HCPs thought that parents asked a lot of annoying questions and that some had a low level of intelligence (IQ). Other reasons that were reported by nurses were that some mothers are depressed and in pain post C-section or have transportation difficulties to commute to the NICU; therefore, parents were unable to commit to a daily massage application. Similar issues were identified in the literature with other touch-based interventions where neonatal nurses identified a number of safety issues with how KMC is implemented as a technique and practical

constraints again mentioning the mothers' pain after a C-section as an impediment (Chia et al., 2006; Blomqvist et al., 2013).

Another concern shared among participants was that the NICU space is small and open, which might affect the confidentiality, privacy and intimacy between parents and their infant while carrying out the care/massage. They added that it might create chaos and difficulty in controlling communication between nurses and parents. Having only one or two parents entering the NICU at a time was proposed as a solution. This strict routine is accompanied by an unfriendly physical setting where there is no space for parents to stay next to their infants.

For the majority of HCPs in the study, the parents' presence in the NICU is a problem as most of the time the staff is overloaded and cannot accommodate or support these parents, due to the limited space available for families. Again, these findings are consistent with other touch-based intervention literature such as the study by Blomqvist et al. (2013) that revealed: physical limitation, limited time, staff work overload and environment-related factors as hindering issues for implementation. The NICU routine in this latter study did not permit parents to be present with the infant during medical rounds because of privacy as well as the lack of information about KMC policy.

Parents also identified practical issues such as transportation difficulties, the physical condition of the mother/infant, household obligations, unavailability of helpful staff, and fear as major barriers to future implementation. Organizational, contextual and practical issues in addition to the lack of information regarding the benefits of massage might hinder its implementation. Again, this raises questions about how HCPs will act to resolve the problem of time shortage, work overload, lack of resources and what incentives are necessary to change the status quo. Perceiving their limitations, HCPs suggested a decrease in workload or having a nurse dedicated for massage implementation such as a massage nurse.

Parents described the same physical limitations and concerns such as transportation and coming to the NICU on a daily basis as well as the time constraints with daily activities as a source of stress and frustration in both Blomqvist et al. (2013) and Bergh et al. (2014). As for the KMC practice, limited physical facilities (rooms, appropriate furniture and privacy) and safety issues (belief that technology is better than KMC) were also sources of stress limiting the application of the intervention (Blomqvist et al., 2013; Bergh et al., 2014). These issues resonate with the MPM barriers as revealed by HCPs in this study; particularly the safety issues. However, the other issues were not found to be problematic such as physical space and privacy; as in Lebanon parents can stand next to the incubator to apply massage.

Based on the findings from HCPs and parents, barriers for infant massage implementation which were observed and evident throughout this study, included the reluctance to commit as revealed by several parents and HCPs. Many HCPs simply did not believe that it should be done by parents in the NICU. They believed that even if they accepted to apply this complex intervention, stress workload on nurses would be a major limiting factor as well as questioning the parents' ability to commit. However, a few nurses suggested that if the parents were not able to commit, the nurses could perform MPM in the NICU. This mirrors the findings from Ferber et al. (2005) that when parents are not able to give the massage, the nurse could perform the intervention. Many HCPs in this study were judgmental and made assumptions about several parents based on their low IQ level, SES, and where they lived (coming from Akkar, or rural areas). They also believed that some parents, even if they were taught, would have difficulty in assimilating the intervention, and one nurse mentioned that she could not trust the parents (Farah, FG 5, Hosp. C).

Discussions with the majority of the parents in this study confirmed that they perceived themselves as passive recipients of care, totally reliant on HCPs and their

decision making. In addition, HCPs seemed to have a negative, stereotypical view of parental abilities and lacked trust in the parents' capacities, further asserted by staff perception of the parents' fear. Such a view created mistrust in the parents' abilities by HCPs. The factors were potential risk and a fear of harming the infant that emerged as the main barriers for implementation. Furthermore, nurses had assumptions about the parents' abilities and role, yet these did not appear to be based on or embrace a deep understanding of the psychological needs of the family. Their focus was primarily on medical interventions.

In contrast, the parents' perception of their NICU experience focused on the lack of staff encouragement and inadequate preparedness in view of staff shortage and workload. The distinction of views shows that parents and HCPs do not understand each other's role. Most parents were anxious and had practical concerns. They highlighted their fear in handling, turning and changing the infant's position if they would practice infant massage in the future. HCPs in most of the FGs acknowledged the fear of parents touching and holding their infant explaining a further mistrust in the parents' abilities by HCPs. For some parents, especially first time parents, it can be very confusing as they consider themselves as passive observers and outsiders in the NICU. These parents totally depend on the HCPs. This highlights the agreement/disagreement between the perceptions and attitudes of parents and HCPs regarding the application of massage in the NICU.

In this study, the idea of MPM was acceptable as the majority acknowledged the benefits for the parents, infants and even the HCPs who would participate in this intervention demonstrating coherence; as the first NPT construct (i.e. buy-in to the idea of MPM). However, the lack of collective action; the third NPT construct was observed due to the practical barriers relating to the non-feasibility of massage application on a routine basis and the fact that the study was hypothetical. The difficulties identified and

portrayed by some parents were in relation to transportation, living far from the NICU, the physical condition of the mother, household obligations as having other children at home, unavailability of helpful staff, and a fear of transmission of infection. Two parents had the fear that the baby might become addicted to the intervention and because they were working they might not be able to commit and continue the intervention after discharge. It is probable that massage becomes a secondary issue to them as they demonstrated their lack of commitment. In addition, all parents claimed the need for training and close supervision as well as continuous education and support from nurses and doctors. One divergent point was reported by a mother in this respect. The mother showed concern that their presence might affect the work dynamics in the neonatal unit and might create insecurity among team workers, who may feel supervised or distracted from their work by the parents' presence. A similar concern was observed in the Blomqvist and Nyqvist study (2011).

Findings from this exploratory study show that there are contextual, organizational and practical/personal inhibitors (Figure 7.1) related to family participation in daily care in the NICU in the Lebanese context as HCPs consider themselves the experts and primary caregivers. Similarly, the majority of parents also considered HCPs as the experts and the main caregivers for their infants. Although parents in most FGs showed readiness to be part of the daily care of their infants, they acknowledged that their role is very limited and they are not ready or prepared to play a greater role. This partially answers RQ3 relating to barriers which will be further supplemented by the detail of the next section.

7.4.3.2 Facilitators

The findings demonstrate that adequate supportive staff, parents as partners in care, gradual implementation, education and training, protocol and guidelines, shared

decision making, staff and parental commitment are among the most important facilitators in the context of MPM (Figure 7.1).

Both HCPs and parents emphasized proper training on MPM and safety issues as a priority concern. HCPs discussed the importance of developing a protocol for the implementation (which infants are eligible, the technique, and parent profile) along with changing organizational and contextual barriers. The areas that need to be addressed are removing the restrictions and improving parental access to the NICU; the visiting policy, arranging appointments for parents, facilitating their stay in the NICU and helping with transportation. The educational level of parents is another issue to be considered for the application of MPM as well as promoting the trust relationship to allow a parent-implemented intervention as part of the daily routine care. For instance, several nurses admitted that many educated parents wanted to have a role. The perception of massage as a positive act by parents and HCPs was also understood as an act to promote the trust relationship between HCP's and the parents. Several studies reinforced the idea of parents practising infant massage as a constructive way to promote FCC and positive parenting (Lappin, 2005; Hanson, 2013).

It was apparent that although the majority of HCP's said they encouraged the idea of parents visiting their infants, in practice most did not involve the parents in their infant's care and few invited parents to touch their babies, except for hospital A (FBFH). It seems that the Hospital A FBFH NICU is a fertile ground for implementation considering that the staff were more sensitive to the needs of parents reflecting a positive collective action; the third NPT construct. This was observed in their communication with and support of the parents promoting a positive learning environment. However, in contrast, hospitals B NBFH and C WBFH were less conducive learning environments where parents were not encouraged to ask questions. Communication and a welcoming atmosphere have been highlighted by various authors

that focused on the importance of supporting parental involvement in the use of touch by HCPs as critical factors (Conz, Merighi, & de Jesus, 2009; Swartz, 2005).

Notable differences in results amongst the three hospitals varied in proportion to the terms of baby friendliness; for instance, only the Hospital A FBFH did nurses raise the issue of cue based massages. Maybe this was related to their educational background as three of them had a diploma in child care and were more sensitive to the infant needs and had a more family centred approach as reflected in their terms of baby friendliness. HCPs in hospital A (FBFH) showed readiness, awareness of the parents' needs and self-confidence regarding teaching and preparing the parents for future implementation. This answers RQ3 relative to the facilitators.

In a descriptive study in Sweden by Blomqvist et al. (2013), it was noted that the parental experience is a key facilitator in the implementation of touch-based interventions in the NICU. Several factors emerged in Blomqvist's study supporting the performance of the KMC intervention including the presence of family and significant proxy members as well as the positive signals that the infant gives to the parent while in a skin to skin position making the implementation more likely. Relative to the factor of time, it was mainly the time available outside of work and the parental benefits granted by the government, which facilitated the initiation and continuity of KMC care. Another important factor was the motivation and positive support of a competent staff that closely followed the parents during their presence in the NICU. Another major incentive for parents was the positive comments by the health team towards their KMC application. Moreover, the NICU environment in terms of safety, privacy, comfort, materials and technical preparedness was considered helpful. The same contextual, individual and organizational issues such as time, motivation, and HCP support were similarly reflected in this study as facilitators (Figure 7.1)

As a worldwide trend, for many years nurses in the NICU have been more focused on medical and technical interventions to meet the physical needs of the infant than on physiological and emotional support in promoting parent-infant interaction (Fenwick, Barclay & Schmied, 2001a; Heermann, Wilson, & Wilhelm, 2005; Foster et al., 2016). The idea that parents should participate in the daily care and be part of decision making as part of therapy is very much a recent Western ideal (Heermann, Wilson, & Wilhelm, 2005; Aagaard & Hall, 2008). For families and HCPs coming from Eastern cultures, this concept is even newer to the NICU environment, as parents are still regarded as outsiders and passive receivers of care (Badr, Abdallah, & Purdy, 2011).

As reported by this study and studies by Hendricks-Muñoz, Louie, Li, Chhun, Prendergast, and Ankola (2010) and Higman, Wallace, Law, Bartle, and Blake (2015), interventions for enhancing the parents' opportunities for performing care in the NICU that include KMC, FCC, and MPM should address the hospital and the staff i.e. improve staff attitudes and practices and the nature of the health care facility and the NICU environment. This would help the implementation process by creating awareness about these interventions as a sustainable practice (Bergh et al., 2012; Bergh et al., 2014; Skene et al., 2012).

The barriers and facilitators for future massage implementation are embedded in the social context which exists in the NICU culture and how parents and HCPs perceive this intervention. In order to better comprehend the misalignment between research findings and best practice in the field of infant massage, it is important to take into consideration the NICU organizational and contextual barriers and facilitators for a deeper understanding. Having a greater comprehension of the gap that exists between research and practice will facilitate their alignment of purpose. For this reason, it is

important to look at massage implementation from a broader view involving parents, not only focusing on the biomedical perspective.

The findings of this doctoral study corroborate previous research that highlight the importance of the cultural values of equity and openness in the NICU; as well as establishing a collaborative relationship with the parents (Fenwick et al., 2001b; Chia et al., 2006; Nyqvist & Engvall, 2009; Bergh et al., 2014). These findings on facilitators specifically concur with the research of Bergh et al. (2014) in Ghana. They found that being accredited with a baby friendly status was found as a facilitating factor for the implementation process (Bergh et al., 2014). Important additional factors to consider were being a teaching hospital and the willingness of HCPs to further provide in-service KMC training.

By performing a touch-based intervention, nurses often get attached to the infants in the NICU as it will emotionally complete their care with a positive act as reported by some of the nurse in hosp. A. However, as a few nurses in this study reported doing this act sparingly when they have time indicates a lack of awareness for its scientific value or their readiness to apply MPM as a routine intervention. It seems that other factors are important to consider as well such as the nurses attitude and organisational and contextual issues. For instance, some nurses highlighted the added value of them providing the massage in the absence of the parents or when parents were not able to enter due to the lack of time or work overload of the HCP staff.

Parents identified communication, encouragement and support and gradual application as major facilitators for potential sustainable implementation. In comparison, HCPs identified contextual and organizational factors, such as human resources, having extra staff and a protocol for teaching nurses and training parents to guarantee a smooth application, commitment to practice and an openness to innovation. These facilitators were also described by May, Johnson, and Finch (2016) in their latest

publication discussing elasticity of context as a critical factor in the adaptability to emerging issues in any complex intervention and therefore applicable to MPM.

This PhD study confirmed the potential complexity of introducing a new intervention to infants in the NICU and the interplay between cultural and contextual factors. The comfort and needs of parents and HCPs as well as the infant should be considered. Parent, infant and nurse-related factors are very much interconnected as they operate in tandem, such as the nurses' expertise, knowledge, perceptions, beliefs and attitudes and the present NICU norms that might affect the successful application of the intervention. Based on the findings of the HCP focus groups, the upper management HNs and consultants need to be proactive and champions in leading the process for the implementation of MPM for its facilitation and finding solutions to incorporate this technique within the daily workload of nurses. The issues needing protocol or organizational constructs include time management, distribution of tasks, entry to the NICU and allowing parents to be part of the care scheduling their frequent visits. This answered RQs 3 and 5.

7.4.4 Appraisal of the implementation of other similar, parent/infant centred initiatives relative to the NPT construct of reflexive monitoring

For this study, the appraisal of the implementation of a process was not feasible as it was a hypothetical situation. Therefore, other similar parent/infant centred touch-based initiatives will be discussed to evaluate whether MPM application is possible in an anticipatory situation.

The data for hospital A (FBFH) were positive about the benefits and use of MPM and reflected a strong trust relationship between nurses and doctors and the nurses and mothers. Mothers in hospital A expressed in different FGs how their trust was gradually built by observing how the nurses dealt with their babies in several

encounters. In contrast the staff of hospitals B (NBFH) and C (WBFH) appreciated MPM, but expressed more hesitation in applying it. In particular, they stressed the need to adapt the contextual and the organizational environment of the NICU to enable parents to enter and practice MPM. Doctors in hospitals B and C were authoritative and held the control for all decision making and leadership. Based on the findings, it was additionally evident that the participants' accounts were highly influenced by their educational background and the organizational structure in the NICU.

The HCPs who took part started to list the inclusion and exclusion criteria for the infants who would be eligible for massage as well as debate what profile of parent would be a potential candidate to apply massage. They even suggested potential solutions for the present situation and projected their ideas/protocol to overcome the barriers such as RN massage. This raises the question about how the teaching would be delivered, the method of delivery, and how much the mother should be taught to care for her infant in the NICU with hands on application and for how long.

The hospital that was a BFH, showed the best ethos and readiness to accept parents as partners in the care and their commitment to engage in massage. Although hospital C is working to become a BFH, it is still in the beginning stages and not well prepared yet. Furthermore, hospital C did not meet the ten steps as reflected by the preliminary internal assessment that was done by the National Infant and Young Child Feeding committee for which this researcher was part of the team and a trainer for the staff. This confirms other evidence that non-fulfillment of the requirements of BFHI negatively affects the ability of a hospital to implement FCC intervention (Smith et al., 2015). Factors favourably affecting other touch-based intervention implementation (such as KMC) are categorized in the literature as institutional (institutional structure and local circumstances), management (cost, policies, administration and logistics), infra-structure (physical structure) and people issues (available staff, parents, cognitive

acceptance, training, and multimedia educational packages) (Blomqvist & Nyqvist, 2011; Blomqvist et al., 2013). In addition, institutional ethos and climate (face-to-face facilitation, communication, interpersonal relations, willingness and motivation, commitment and care, professionalism, respect for human rights, and judicious use of resources) were also important in facilitating the intervention (Pattinson et al., 2005; Chia et al., 2006; Bergh & Pattinson, 2003; Bergh et al., 2008; Nyqvist et al., 2010; Bergh et al., 2013; White & Wilson, 2015; Skene et al., 2012).

Reflecting on other touch-based intervention literature (Strand, Blomqvist, Gradin, & Nyqvist, 2014), staff working in the NICU that gave parents unrestricted access were more positive than staff in the NICU that offered limited opportunities for parents to stay with their children. In consensus with my study, this finding suggests that it is important to eliminate unjustified obstacles to the presence of parents in the NICU for them to be able to provide care. For instance, a similar initiative previously highlighted in the Lebanese NICUs was the introduction of a simple oil application. This might be an excellent initiator for future culturally acceptable massage application derived from Lebanese tradition. This answered RQs 3 and 5.

The NICU environment in resource rich countries in the West underwent several transformations from the traditional role to their current concept of FCC. They were able to comprehend the urgent need and struggled to apply new research findings and explain the features and phenomena that are associated with developments such as FCC, KMC, and SSC. As for resource poor countries in the East, they have not yet experienced this battle, which explains the relative difference between modernism and traditionalism as a barrier to development. The NICU organization in resource poor countries strives to adopt the general principles of FCC within the NICU design and space. However, they are not able to accommodate the families' developmental, emotional, educational and social needs.

Many NICUs in Lebanon are trying to change the parent visiting practices to an "open door policy". Yet, this change in practice is difficult during nursing and medical rounds and procedures. The application is still superficial and not always sustainable as it entails further change at the micro and macro levels and an enhancement of the potential for positive change with an insight into evolving cultures. Through the research of White and Wilson (2015) in Australia, this can be better understood with greater chances of implementation.

Despite the growing evidence for the positive results of MPM, significant work is still needed in building and disseminating the evidence base and developing comprehensive culturally sensitive programs to extend its implementation (Shields, Zhou, Taylor, Hunter, Munns, & Watts, 2012; Nichols, 2013). Developing a greater understanding of this divergence of cultural ideals and research findings would help bridge the gap between research and practice in the area of infant massage in the NICU.

Lebanon, as a developing country, is strongly affected by westernization and likely to adopt a European or American model intervention program to guide their practice, especially as applied to healthcare institutions (Badr et al., 2011; DeJong et al., 2010). The family is the main social unit taking care of its members, especially children with special needs, as it is part of the religious beliefs and value system of the Lebanese culture (Dumit, 2008). The findings of this study showed that many parents were ready to perform massage in the NICU. However, the impact of past personal experience, individual attitude, and cultural perception might influence their decision and commitment to future massage practice despite the perceived potential value of massage. Therefore, NICU care should first recognize the importance of early preterm/LBW infant-mother contact and envisage a process whereby an intervention can be applied in clinical practice as a strategy to facilitate the successful implementation of such a complex intervention.

7.5 Critiquing the Appropriateness of NPT as the Theoretical Framework for the Study

Considering the subjective multidimensional nature of MPM as a new intervention, NPT was a valuable lens to make sense of the emergent findings from this exploratory qualitative study. NPT was a coherent, practical theoretical framework to support this study; it informed the questions, the topic guide used for the FGs with parents and HCPs and informed data analysis for the empirical phase. NPT draws on processes through which work becomes embedded in everyday practice (May et al., 2009) to address the observed difficulty in implementing new interventions in clinical settings (May et al., 2007, 2009).

Since there are numerous theories that have provided explanations of how and why an implementation can succeed or fail (Nilsen, 2015), deciding on a theoretical framework that fit the aspects of the study and related to the MRC modelling phase as well, was a challenge. Also, there is no available formula that predicts which theory is best to use underpinning implementation research (French et al., 2012). For example, as explained by May et al. (2007, 2009, 2010), some theories focus more on structural issues, others on individual or cognitive factors. Although NPT does not assist in predicting an individual's intention or subsequent behavior, it does support a rational explanation of the variations in events and processes relating to the implementation of new complex interventions in health care systems (May et al., 2007) that were collected during my FGs, reflective diary and observations in the three hospital settings. This is in line with the modelling stage of the MRC framework.

Therefore, NPT was chosen because in comparison to other potential theoretical lenses through which to approach the study, it provided the most articulate, practical, scientific and comprehensive approach. However, one limitation of NPT according to

Alharbi et al. (2014) is that it does not describe or identify factors influencing the speed of the implementation; a possible reason might be that time is a subjective factor. Even though the study of this thesis is hypothetical, it is still worthy to note that the time needed to apply the MPM intervention cannot be predicted due to the subjective factor of time and situation. The speed of implementation would therefore differ even between hospitals according to the interplay between contextual, practical and organizational factors specific to the environment giving insight on implementation.

To better understand the implementation issues and to fill the gap between theory and practice in health care, an explanatory hypothetical model was developed from the analysis and guided by the NPT four constructs (Figure 7.1) as described in section 7.3. The first two constructs, "coherence" and "cognitive participation" allowed for exploration of process issues (i.e. the implementation of new ways of thinking, acting and organizing in health care). Coherence was observed in the acceptance of the MPM concept and cognitive participation was applied to identify the benefits and risks raised by parents and HCPs clarifying their reservations. "Collective action" and "reflexive monitoring" enabled consideration of structural issues (i.e. the integration of new practice into existing organizational and professional health care settings).

In this study, NPT was adapted using its major constructs to guide the investigation of parent-implemented infant MPM in advance of its implementation, with the aim of providing a systematic and comprehensive mapping of the human, organizational and resource changes (May, et al., 2010, p. 10) that an intervention like MPM will require. This proposed implementation of an intervention like massage in whatever form would only be possible with major structural and/or organizational changes to healthcare delivery. For example, the parents suggested providing a chair beside every preterm infant incubator for the application of massage to infants in

NICUs in order to accommodate their presence, with nurses to teach them how to apply this massage to their infants.

We should understand before starting any implementation of MPM that this intervention is aspirational. First, to design high quality trials, there needs to be an understanding of the contextual and organization aspects that might affect implementation in a trial. Second, researchers should investigate whether the likely benefit of massage intervention justifies these changes and start working early on with policymakers and others to build support for implementing this intervention. Then researchers and policymakers can better judge whether the required changes are feasible on a wider scale. The understanding provided by this study is needed for future studies contributing data relative to the effectiveness/benefits of MPM as advised by the various complementary phases of the MRC framework. The way NPT supports this process is much the same as for looking at intervention components, which means NPT would underpin the generation of qualitative data with representatives of those affected by the planned study, i.e. taking the opinion of doctors, nurses, mothers and others to consider normalization issues.

NPT was helpful to guide the process of inquiry and explore the potential implementation process of infant massage in the NICU by the parents. It was used as a guide and as an organizing structure for the investigation and to make sense of the themes that emerged from analysis i.e. as an exploratory data generation scheme. It thereby aided in the interpretation of the study results and guided recommendations regarding future implementation in the Lebanese NICU environment as well. Using NPT to underpin this study provided an analytical theory with a conceptually coherent and structured framework to explore how individuals think about MPM and guide the future implementation of infant massage in the NICU system of care. This study predicted barriers and facilitators during pre-implementation. For instance, the mistrust

of HCPs in parents mainly out of fear of unsafe practice has cemented the passive role of parents in the NICU.

It was reassuring to understand that NPT can be used at any stage of the qualitative lifecycle i.e. pre-implementation as it was used in this thesis and as reported and verified from other studies (May et al., 2007, 2009). Other authors, such as Murray et al. (2010) advocated that the NPT may be useful in drawing the clinician's attention to potential problems when planning an implementation and the way to best address them before and during the process. In the research of this thesis, this might include changing the HCPs' status quo where parents are partners in care and HCPs are sharing knowledge and assisting them; not being the sole care providers. This change in role can also become a potentially threatening situation for the HCPs as they are going to be asked questions, held more accountable and assume a teaching role on demand, no longer at their discretion. This answered RQ3.

The comprehensive perspective provided by NPT is contextually based and allows conclusions to be drawn regarding why MPM will or will not work from process and structural perspectives such as the NICU facility and environment. This perspective has encouraged exploration of the potential acceptance of massage as an intervention, considering key cultural, organizational and practical contexts (May, 2013a). The NPT's four constructs of implementation were instrumental as the study evolved to tease out the themes and subthemes from the excerpts and observations presented in chapters four, five and six. Extensive excerpts from the data were presented in previous chapters to confirm that the findings were grounded in the data and coincided with the NPT framework, creating a conceptual model (Figure 7.1).

What emerged from the FGs was a conceptual explanatory study model of the parents' and HCPs' understanding of the anticipatory processes that might inhibit or promote future infant massage implementation by parents in the NICU linked to the

RQs (NPT adapted model Figure 7.1). In addition, the concepts in the proposed model are described in the context of the participants' stories and literature supported by the NPT. Predicted barriers and facilitators were identified such as work overload and supportive staff to guide culturally congruent infant massage care for premature infants in the Lebanese NICU environment. The model also acknowledged other practical and personal factors (transportation difficulties, staff attitude and resistance to change) that might inhibit or promote infant massage application by parents in the NICU as well as the challenges to be faced and the way the process would be facilitated.

The anticipated implementation process passes through four interlinked stages according to May et al. (2009). In this study, the constructs of NPT theory have been applied and interpreted starting with coherence to understand the value of massage and to differentiate it from usual care. Then with cognitive participation, it identifies the benefits and risks and willingness or reluctance to engage in MPM. This is followed by the collective action within the potential implementation process, as it defines and describes the facilitators and barriers that promote or inhibit future implementation. And lastly, it ends with reflexive monitoring to appraise the implementation of other similar parent/infant centred initiatives to ensure sustainability.

The four constructs are interlinked simultaneously and do not necessarily operate sequentially. They involve the actions and reactions of people when they are faced with innovation and the organizing actions that they propose or 'produce and reproduce' to facilitate or refute the innovation within the social system where they operate (May et al., 2007, 2009, 2010). NPT (May & Finch, 2009) suggests that routine development benefits from all of the four constructs. Having the four interconnected constructs of NPT is advantageous to assessing the impact of change in any one construct.

The NPT model has been widely used in literature; as a conceptual map for the evaluation of complex intervention and for testing NPT as a structural support (Murray et al., 2010; May et al., 2007; James, 2011). For instance, the study by Gallacher et al., (2011) used NPT to describe components of treatment burden in chronic heart failure patients at the individual and organizational levels. They identified that NPT did not capture the emotional burden of treatment for those living with chronic heart failure as it is better designed to capture organizational change rather than individual aspects. However my findings do support the emotional issues parents wrestled with as widely detailed in the FGs though not listed within the four constructs such as fear and anxiety.

Another disadvantage of NPT is the overlap and difficulty of discerning the difference between constructs (Franx et al. 2012). This difficulty was noted by Franx et al. (2012) when using the NPT for the stepped care model for depression. They reported, however, that the NPT was useful to support the analysis and interpretation of qualitative findings, and to generate an in-depth understanding of the stepped-care implementation process. This drawback of overlap and lack of clarity was also experienced during the study of this thesis as similarities between cognitive participation and collective action were found as seen in section 7.4.2. However, to overcome this issue, I included as a pragmatic approach all the risks and benefits reported by parents and HCPs under “Cognitive Participation” and the contextual and organizational barriers and facilitators under “Collective Action”. Moreover, Franx (2012) criticized the fact that NPT emphasises the work of embedding and sustaining practices and that NPT is focused on the perceptions of the relationships between people rather than on contextual factors. To overcome this drawback in the NPT and since my study is hypothetical, embedding and sustaining were not relevant. Therefore, I considered the potential practical/individual barriers reported by parents and HCPs under “Collective Action” in my interpretation of findings (Figure 7.1). In this study,

parents were heard to want more involvement in the NICU care in general, not just to do massage. Developing a culture where parents can take part in the care of their infant not only requires a change in NICU practices and institutional support, but also challenges the organizational and traditional roles of both parents and HCPs in the NICU. This reveals an issue beyond the potential implementation of massage.

7.6 Conclusion

In Lebanon, like many Eastern countries, the role of parents in the NICU is very limited. Parents have no voice and no choice in the NICU. Several parents complained that they could not even touch or hold their infant during the stay in the NICU. The idea that parents should have a role in the NICU was initiated in the West.

MPM made sense to participants and was intuitively appealing to both HCPs and parents. However, the lack of parents' involvement in the NICU in general, and absence of MPM intervention in particular within the NICU context meant that the MPM intervention to promote the infant's health would be difficult to implement. Adopting infant massage in the Lebanese NICUs without understanding and preparing the setting in terms of human and material resources would definitely be premature and problematic due to the contextual and organizational as well as the practical barriers. In this study, participants were asked to consider the intervention theoretically which provided a coherent and structured lens supported by the NPT constructs. This assisted the parents and HCPs to think about future implementation as proposed by May and Finch (2009).

Within the context of this study, the factors that might act as barriers and facilitators for massage implementation were revealed by each group, whether parents or HCPs, based on their cultural perspective and context. Parents did not want to jeopardize the health of the infant and mainly expressed their fears and worries about

the potential risks of massage. On the other hand, the majority of HCPs stressed that massage is a complex intervention that requires time commitment, training and devotion, hesitant to include parents in the process.

The explanatory model in Figure 7.1 provided a diagrammatic representation of the complex findings arising from the data. The NPT was useful, as a heuristic device to make sense of findings and assisted in showing the dynamic and complex nature of 'massage implementation' as discussed in different FGs or the so called "degree of plasticity" of the intervention (May, Johnson & Finch, 2016, p.7). An issue arose for both parents and HCPs during the research of this thesis concerning the lack of clarity in the nature and scope of infant massage in the NICU as it was something new. The findings discussed were related to the anticipation of the MPM practice after watching a video on preterm infant massage in the NICU. The key findings of the study in relation to the literature underpinned by the four constructs of the NPT model revealed that although massage is culturally acceptable, there are still potential challenges which might impede the application of this intervention. The major concerns were staff work overload, time constraints and the shift of power in favour of the parents as main reasons why HCPs and parents may resist change as a protective reaction.

Referencing literature on other touch-based interventions with a similar approach, relevant and instrumental observations can provide insight into the NICU context. Although the reviewed literature on other touch-based intervention does not exactly characterize the Lebanese NICU context of the present study, they do share sufficient similar concerns in implementation to highlight the potential barriers that need to be addressed before implementation.

This study which sought to understand the possibility of massage implementation in the Lebanese NICU context has the potential to strengthen the pre-implementation phase needed for the future of massage being implemented in the

Lebanese NICU setting. In addition, it highlighted deficient aspects of the NICU culture which extend beyond implementation of MPM. The NPT successfully supported this study to understand the pre-implementation of a complex intervention, as well as to highlight how parents and HCPs would handle and react to a new intervention at the practical level.

CHAPTER 8 : CONCLUSIONS, LIMITATIONS, STRENGTHS AND RECOMMENDATIONS

8.1 Chapter Overview

This final chapter presents the study's contributions to the body of literature providing the perspective of the parents and HCPs and their involvement in infant massage in the NICU. The data provide a depth of understanding and perceptions when addressing the strengths and limitations of its implementation. The chapter continues on to reflect on the theoretical approach that underpinned the study; advising that to develop more successful partnerships for infant care within the NICU context, a shift is required in the way the parents' involvement is conceptualised, and how it will be responded to by HCPs and policy makers. The chapter closes with recommendations for education, policy, practice and avenues for future research from the indicators provided through this study.

8.2 Study Contribution

This study, underpinned by the NPT, makes a significant contribution to the body of literature in this field. This research is the first to explore the perceptions, attitudes and key factors that could potentially promote or detract from the application of MPM in the NICU from the perspectives of Lebanese HCPs and parents. It also explored the meaning parents and HCPs attribute to the potential barriers and facilitators of a parent-implemented infant MPM in the NICU. Greater attention to relational aspects of the provision of NICU care is crucially important in terms of making the parents' involvement in their infant's care not only possible, but more probable.

The conclusion of this study has a unique contribution in voicing parents' and HCPs' views and concerns. It adds to the body of literature by identifying the key drivers of implementation to guide researchers and HCPs, particularly nurses and physicians on the best strategies to adopt for infant massage in the NICU. However, further studies are needed taking into consideration cultural, organizational and contextual factors, to establish effectiveness before the intervention can be fully endorsed or implemented. The participants highlighted many aspects of their concerns relative to the facilitators and barriers for parent-implemented infant MPM in the NICU. This culturally sensitive comprehensive perspective that is contextually based focusing on the parents' role and the role of HCPs in the NICU has implications on education, clinical practice and research. These findings can provide researchers with important details and subtleties of information when they want to successfully create the design and implementation of clinical trials in the field of massage.

The study's findings fill a significant gap in the literature by highlighting the contextual and organizational barriers and facilitators in relation to infant massage application in the NICU. Currently, it is not recommended as a non-pharmacological intervention in Lebanese NICUs. However, this study has paved the way for research to design a more context-sensitive trial. Despite the participants' interest in the intervention, many found risks and barriers for its application. This highlights a discrepancy between the participants' perceptions and expectations and their intention and willingness for application in the current NICU setting. Parents might be willing to come to the NICU on a daily basis to apply MPM, if supported by the HCPs. However, the HCPs believe it is difficult to find time to assist the parents. The greatest impediments noted were the lack of the HCP's time, the HCPs' perception of parents as outsiders and a low level of knowledge on the part of HCPs to administer effective massage as well as a lack of awareness of positive outcomes. Both parent and HCP

knowledge is driven by cultural norms where preterm/LBW infants are perceived as vulnerable by parents and the contextual experiences where the HCPs are considered the primary caregivers in the NICU. Hence, before applying massage, there is a need to study the processes through which the massage techniques work for parents and HCPs and how these can be translated into an effective practice that can contribute to improve parent-infant wellbeing. Other barriers are related to the lack of regular parental access to the NICU, poor resources, and a lack of professional training.

In accordance with the four constructs of the NPT, this study evaluated the Lebanese NICU culture for care practices and perceptions of HCPs and parents with respect to MPM. The four constructs of NPT served to reframe the initial findings and describe relevant issues related to the "coherence" and "cognitive participation" as important drivers for future implementation. However, the first two constructs were insufficient to convince parents and HCPs to 'buy in' on the need for the implementation of this intervention. In fact, as evidenced through this research and reflected through the NPT constructs, massage intervention needs more preparation and development at the organizational and contextual levels to be implemented effectively.

The NPT construct of "collective action" only provided partial guidance in highlighting the barriers for future massage application in the NICU. Other related contextual factors that were not covered by NPT are the practical barriers discussed by parents in chapter 4, and the emotional burden of the future application of this intervention on HCPs and parents as explained in chapter 6. Examples are seen in the nurses' ambivalence of having parents as partners in the care of their infant in the NICU or their becoming 'insiders', and in contrast, the parents' desire to become part of their infant's care or no longer 'outsiders'. The last construct "reflexive monitoring" was not fully used as the intervention was still hypothetical. However, it successfully highlighted the recommended facilitators by HCPs and parents for future massage

application in the NICU. Hopefully, this understanding will positively influence future attempts for implementation as reflected in shared decision making (May, 2006; May, 2013a; May, 2013b). The recommended facilitators can enable key decision makers to make care decisions and initiate care actions that are culturally and contextually congruent with the views, beliefs and perceptions of Lebanese HCPs and parents.

Another important contribution from this study is to understand the doctors' views relative to this intervention. In most of the studies in literature, the nurses' views were the main focus of exploration because they are the main caregivers and no studies have sought to identify the doctors' views of parent implemented MPM. However, doctors are very influential in the NICU as they are writing the orders, setting the protocols and giving permission for parents to touch their infants. In other words, they influence the care provided by nurses and dominate the interactions parents have with their infants. In this study, doctors were in favor of MPM and did not object to its implementation if the nurses' time permitted. Understanding the value doctors' place on MPM would help advocate for NICU policy changes.

Although nurses reported several barriers and concerns for parent-MPM implementation, they perceived the intervention in itself achievable and they felt able to learn its application and perform the task. They valued it, but many verbalised that they would rather do it themselves instead of teaching the parents to do it due to fear of harm, time constraints and work overload. Many nurses also perceived the intervention as a threat to their role in the NICU and a loss of their control. Some nurses' perceptions of barriers were relatively personal involving their preference and willingness to commit to the practice. Therefore, implementing MPM in the Lebanese context is not a straightforward activity. It implies dedication, commitment and shared decision making on behalf of nurses as well as parents. In addition, since MPM is not a lifesaving care activity, postponing the execution of this activity might be commonly observed since

most Lebanese NICUs are following the medical approach to care rather than the FCC approach and therefore MPM is not viewed as a high priority care activity.

It is crucial, however, to know how parents and HCPs perceive massage as an intervention in the NICU. Massage is considered as a non-invasive, easy to learn, and affordable intervention by the majority of HCPs and parents usually have a strong desire to be close to their infant(s). Nevertheless, parents have their typical uncertainties and worries causing their hesitation to touch their preterm infant; afraid to touch their infants in any way that might make them uncomfortable or distressed. Parents are also uncomfortable if their infant's health status is unstable. It is difficult to differentiate between parental fears due to the fragility of their infants or to what degree HCPs have influenced those fears. This study found that sometimes HCPs are imposing these ideas on parents by asking them not to touch their infant or by not encouraging them to do so mainly out of fear of infection as reported by several parents. They have explained that they feel they cannot trust parents. This in itself encourages fear rather than encouraging the attainment of an active parental role. However, this intervention might resolve the parents' perception of their need to touch their infants to counter the negative effects of separation. The study also indicated that support for parents was lacking in general. Parents need information and guidance from nurses on how and when to touch their infant. Lack of support in general was in accordance with previous research on the topic as discussed in chapter seven. Thus, addressing some of the contextual and organizational issues might open the door for engaging parents in MPM. Touch and MPM can be translated by the parents as a positive emotional expression of love and care to foster attachment. The provision of massage by parents might give them an opportunity to connect with their infants through the senses.

A favourable encouraging NICU environment is a key factor in facilitating touch interactions between the parents and the infants in the NICU in general whether

through MPM or other means. Inadequate emotional support by nurses can affect parental visitation and the willingness of the parents to participate in their infant‘s care. Parents coming from diverse socioeconomic backgrounds all usually have the desire to learn and engage in touch interaction with their infant. The real challenge for HCPs, however, is how to address each parent according to his/her level of education, individual needs and ability to comprehend the information.

The transfer of power from nurses to parents is another issue because nurses in Lebanon are usually the ones who provide the care and engage in all necessary touch and the parents are passive observers. In this study, both nurses and parents voiced their fear as a major issue and a barrier for implementation. Therefore, good HCP-parent communication, instruction, encouragement and support should be observed in order to dispel any potential fear and minimize the negative concerns of parents. Parents must be educated and empowered to have direct, purposeful, and routine involvement in their infant's care to reduce the impact of separation, increase bonding, and facilitate the transition to the home for the family. Therefore, early and good communication between parents and HCPs as well as support and education are crucial elements to support the future implementation of MPM. This in turn will facilitate the parents’ involvement in the NICU enhancing early bonding and parent-infant interaction. Missing this opportunity to involve parents in NICU care can put the family in a difficult situation to adapt to the new challenges after their infant’s discharge.

The conversations and explanations by parents and HCPs enhanced the understanding of how parents and HCPs perceive their role in the NICU in Lebanon. They revealed how the dominant NICU cultural and organizational norms affect their perceptions, attitudes and willingness to engage in MPM across different hospitals and regions as organizational differences play a role in perception and attitudes. The present study provided a framework for better understanding the Lebanese NICU context,

barriers and facilitators that can affect or impede future parent-implemented infant MPM.

8.3 Reflection on the Study's Limitations and Strengths

8.3.1 The study's limitations

Some limitations are acknowledged in relation to the research design. The design required refinement in the early stages of data capture. Initially the study did not include other family members, particularly fathers, in the recruitment process. However, realizing the potential value, I quickly amended my study inclusion criteria/protocol to include other family members who showed interest in taking part of the FG discussions and therefore sought IRB approval for a second time. Moreover, another issue was the parents' recruitment as it was challenging, carried out in a period of political turmoil when car bombs were frequent particularly near one of the hospitals included in this study. This affected the parent enrolment as for example two couples excused themselves from coming at the last minute to one of the sessions. More time was necessary to identify other couples in this hospital to reach the required sample size. The sample of parents and HCPs relied on only three university-affiliated private hospitals. Other parent and HCP opinions in settings such as small hospitals might perceive parent implemented infant MPM differently, though this was not attainable with the scope of this study.

As a lactation consultant, nurse and mother, I could identify with the mothers' needs to touch and hold their infant as well as identifying with the nurses. As such, more time was given for mothers to express their feelings and concerns about breastfeeding and assisted those mothers needing breastfeeding support and early infant care. However, I was extremely careful to remain neutral and sensitive to all indicators from both mothers and nurses. When I embarked on my PhD journey, I already had

quite a significant degree of insights and expertise on the issue of MPM. Approaching the PhD study with a pre-set agenda I may have been biased; however, being very diligent and aware throughout the study to maintain a healthy perspective through a number of venues such as my reflective journal/log, listening to the feedback of my supervisors, and presenting my work in student research forums to receive feedback and challenge some of my findings as the study progressed. This successfully kept me in check with the correct parameters and a healthy perspective.

Another challenge was my novice status as a qualitative researcher. During the FGs and the observation, I was not very confident at the beginning. However, I learned quickly and amended my style, tailoring my topic guide accordingly to accommodate minor imperfections. Another issue was that the interviews were in Arabic for participants to express themselves freely in their native language; however, written notes were taken regarding participants' feelings and interactions in English. Therefore this limitation relates to language and the translation from Arabic to English and understanding cultural nuances. Some cultural meanings and attached feelings were impossible to translate and as such, some of the meaning may have been lost. However, to overcome this limitation, careful comparison between the languages was followed by different multilingual scholars, myself and another research colleague from Lebanon, to guarantee the accuracy of meaning and rigour of the process to the best of our ability.

In addition, this study used the four constructs of the NPT as a heuristic tool for data generation and analysis. Some weaknesses to be observed using the NPT are that although the NPT is flexible, it can be interpreted differently by different researchers. The NPT was a helpful structure to guide my findings, but there were some limitations to its use and it was not specifically designed for my study. The NPT as an implementation theory could be better used if the MPM was to be actually implemented and not presented hypothetically before the implementation as was done in this thesis. I

have therefore not used it in its totality. I have used it in a manner melding it to the particular needs and in the context of my study and this may have caused a limitation in that I modified its application in a way that some might not totally agree with. Another issue is that the NPT does not focus on the decision-making process and does not maintain a clear perspective on the intervention. The last thesis question relating to the interplay between contextual and organizational factors was not fully answered due to the intervention being hypothetical, and it was difficult for parents, in particular, to think about how they might adjust their situation to become an effective part of NICU care.

8.3.2 The study's strengths

This study provides valuable and enriching findings to the body of knowledge regarding parent-implemented infant MPM through answering the research questions of this thesis. It sheds light on a subject that has not been previously tackled. There are no other studies that explore the parents' and HCPs' perceptions and attitudes regarding the barriers and facilitators for parent-implemented infant MPM in the NICU. Therefore, comparisons with prior findings were and are not possible or applicable. The study was carried out with parents and HCPs with the specific intention of obtaining a diversified population having different levels of education and from different contexts and regions. Moreover, this study was unique in exploring the doctors' and particularly the neonatologists' perceptions and attitudes in addition to those of the nurses. The latter group is instrumental in setting NICU protocols and policies in the Lebanese NICU context. Furthermore, the FGs discussions and observations done in the NICUs were enriching and ensured the robustness of the study. It gave parents and HCPs the occasion to articulate their concerns and needs as well as the opportunity to voice their fears and aspirations from their own perspectives rather than having them taken for

granted. This will hopefully add to the neonatal care sciences literature about this topic using a naturalistic approach strengthened by the underpinning theory of the NPT four constructs.

Thus, these findings can serve to enhance our perceptions and attitudes towards parent-implemented infant MPM and its potential role in promoting the infants' health and parent-infant interaction. The findings that emerged from this study although specifically pertinent to the Lebanese NICU environment might also be transferable to other similar contexts. Using a qualitative approach was a unique contribution and instrumental to explore this concept building a comprehensive framework in a theoretical model (Figure 7.1) to understand parent-implemented infant MPM more profoundly. What emerged from the focus groups was a conceptual framework (Figure 7.1) that provided a generic account of how people construct the value attributed to future infant massage implementation in the NICU and the perceptions of risk, potential barriers and facilitators detailed through conceptual themes and subthemes.

From the perspective of a nurse-educator and lactation consultant as well as researcher, suggestions to inform policy/practice, education and direction for future research are presented in the following sections.

8.4 Implications for Future Research, Education, and Practice

8.4.1 Recommendations for future research

Large scale RCTs are needed to study the long term effects of MPM. As no studies were found that elucidate the contextual and cultural barriers and facilitators for massage implementation in the NICU, this study was valuable and can be tested by an RCT. To date, since most studies of massage have been carried out in resource rich countries; there is a question about the applicability of this intervention in other NICU contexts and cultures. Therefore, more studies are needed on this to corroborate the findings of this thesis. In Lebanon, parental involvement does not include participatory

care (such as: therapeutic touch based interventions, changing the diaper or feeding the infant), even if the infant is stable. Most hospitals in Lebanon are understaffed. Nurses are overloaded with routine care and documentation. Therefore, future studies should focus on soliciting detailed suggestions and a plan of action from key stakeholders for the implementation of MPM if it is found to be effective. Assessing the concerns, perceptions and attitudes of parents having an infant in the NICU and their views of FCC and early touch-based interventions will naturally concur with what this study has found.

As a conclusion, I produced a comprehensive model as a way of making sense of my findings to underpin and support my discussion chapter. Evidenced through applying NPT, the MPM could not possibly be implemented in a sustainable manner due to the lack of major signals to facilitate its implementation in the Lebanese NICU environment. NICUs in Lebanon are not yet ready for such a complex intervention. Currently, HCPs are overwhelmed and need time to get ready to implememt such a complex intervention. Preparatory steps are needed to adjust the groundwork, such as training HCPs and parents, setting procedures within the NICU and guarantee organizational support. The use of NPT as a sensitizing framework provided a greater insight into the beliefs and values of both the parents and HCPs. It helped to understand the findings as they were linked to NPT, or the relevance of NPT to the findings. The NPT helped to identify and examine data from the cultural, contextual, and organizational dimensions of parents and HCPs. In general, NPT was useful to guide the research questions, to inform the analysis and uncover major barriers and strategies to facilitate future massage implementation in Lebanese NICUs.

The implications of this dissertation are of vital importance to the health care system and the potentially improved health of the preterm infant. It reflects the current nursing NICU practices in Lebanon. It also provides the facilitators and barriers that

HCPs and parents may hold towards future implementation of complex interventions such as massage in the NICU. It helped to better understand the impediments to future implementation and gave an insight on how to overcome these barriers. This could entail introducing procedural changes before the potential implementation. Based on the results of this study, it would be worthy to design and conduct an actual interventional study in the NICU to test the effectiveness of the intervention taking into consideration the barriers and facilitators through the four NPT constructs and the model described in the discussion chapter. This would test the contribution made by this study to understand the issues of parent-implemented infant MPM and how the NPT constructs assist in the understanding of the factors affecting this implementation. Future MPM research should also consider including senior hospital management to support and normalize MPM practice.

8.4.2 Recommendations for practice

Addressing the barriers for involving parents in the NICU is crucial for promoting the adoption of MPM. The efforts should be to include evidence based information on infant touch and massage to counter prior models of practice i.e. minimal touch, and replace it with a more parental approach to care. Efforts should be made to have an open door policy for parents and minimize the workload of nurses to accommodate parents and dedicate time for such interventions. One suggestion might be that future interventions/recommendations need to explore other types of infant massage such as head, neck and foot massage comparably useful as a touch-based therapy that could be implemented as an initiation or step up leading to MPM. This brief massage technique would be answerable to the concerns of fearful mothers, where there is no need to turn/position the infant in the incubator as this was a point of discussion in most parent FGs.

As for the issue of commitment and transportation, maybe another possibility is to establish a fund for parents to help needy families with transportation expenses, particularly for those coming from remote areas (North and South). Moreover, to provide a place for parents to stay overnight near their infants during their stay in the NICU was another suggestion. In fact, in hospital A, one of the attending doctors suggested providing rooms for parents to rent at an affordable price near the hospital. A suggestion from parents was to have a room for them in the NICU to be able to stay with their infant in a private setting to facilitate bonding. Other examples might be the use of audiovisual streaming to assist parents in monitoring their infant with hospital webcams in the NICU such as:
(http://www.tampabayparenting.com/42373/video-streaming-technology-babies-nicu/) or (http://edition.cnn.com/2011/12/12/health/webcams-nicu-hospital-infants/index.html)

Additionally, it would be beneficial to educate parents about the benefits of touch-based interventions as a routine practice by the use of dolls before delivery or as soon as possible after delivery to build their self-confidence and to better understand the behavioral cues of infants to facilitate attachment. In order to implement MPM, HCPs need to be prepared to assist parents to confront their fears. Nurses specifically should be educated and guided by specialized instructors to support this intervention. Staff in service education should teach nurses how to promote touch-based interventions such as infant MPM to enhance parent-infant attachment equally important as parental involvement in the care of their infants.

Having a good grasp of the potential facilitators, removing the barriers and building on the commonalities between HCPs' and parents' perceptions and attitudes would open the door for successful future implementation. What is of the greatest importance is to build on the similarities that parents and HCPs perceived in implementing MPM. In this way the contextual, organizational and practical factors

can be successfully addressed in order to provide the necessary infant support needed in the NICU by involving parents in their care. This would pave the way for future culturally sensitive RCTs of MPM in Lebanon based on the findings of this study. As a result, HCPs and parents would be moving towards achieving the holistic approach in health care delivery such as or including MPM beyond the physical needs addressing the emotional and psychological needs of both the infant and its parents.

8.4.3 Recommendations for education

Little attention has been given to the doctors' and nurses' curricula in regard to preparing them to respond to parents' needs in the NICU. This issue should be expanded to empower parents in assuming their parental role. HCPs are required to have a supportive educational role in preparing parents to establish control over the NICU experience and to promote parent-infant interaction. They also have a role in delivering holistic care by teaching and preparing parents to become partners in care, being ready for discharge and knowing how to respond to their infant's needs. As an integral part of their role, HCPs are obliged to upgrade their knowledge and further develop their skills to respond to the needs of parents and deliver comprehensive FCC. As revealed through the process of FCC, when parents experience more control and support in the NICU environment they can better bond and assume their role of parent to their infant for future application.

In my capacity as an educator in different nursing and public health courses and being a lactation consultant and a member of the neonatal research groups Council of International Neonatal Nurses (COINN) and the UOD Mother and Infant Research Unit (MIRU) and the Order of Nurses in Lebanon, I advocate this role with my colleagues, students and trainees. As a direct result of this research, I have added a module in the Nursing Care of Children course at UOB. Additionally, it has been proposed that a forthcoming masters' programme will include education about the importance of touch

and massage to be performed by parents in the NICU. It may be some time before the study findings impact more widely on the nursing practice. However, the claim can be made that this PhD study has already impacted positively on nurse education locally, which in turn, has potential to impact on future practice.

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Winberg, J. (2005). Mother and newborn baby: Mutual regulation of physiology and behavior - A selective review. *Developmental Psychobiology*, *47*(3), 217-229. doi: 10.1002/ dev.20094

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World Health Organization, & UNICEF. (2009). *Baby-friendly hospital initiative*. Geneva, Switzerland: WHO Press. Retrieved from http://apps.who.int/iris/bitstream/10665/43593/1/9789241594967_eng.pdf

World Health Organization. (2015). *World health statistics 2015*. Geneva: Author. Retrieved from http://apps.who.int/iris/bitstream/10665/170250/1/9789240694439_eng.pdf?ua=1&ua=1

Yapijakis, C. (2009). Hippocrates of Kos, the father of clinical medicine, and Asclepiades of Bithynia, the father of molecular medicine. *in vivo, 23(4),* 507-514.

Zealey, C. (2005). The benefits of infant massage: A critical review. *Community Practitioner, 78*(3), 98-102.

APPENDICES

Appendix 1: Literature Review Search Strategy; Terms and Databases

The following are examples of the search strategy done:

OVID THROUGH NHS August Week 4 2010 Result: 49

Database: Ovid MEDLINE(R) <1950 to August Week 4 2010>, EBM Reviews - ACP Journal Club <1991 to August 2010>, EBM Reviews - Cochrane Central Register of Controlled Trials <3rd Quarter 2010>, EBM Reviews - Cochrane Database of Systematic Reviews <2005 to August 2010>, EBM Reviews - Database of Abstracts of Reviews of Effects <3rd Quarter 2010>, EBM Reviews - Cochrane Methodology Register <3rd Quarter 2010>, EBM Reviews - Health Technology Assessment <3rd Quarter 2010>, EBM Reviews - NHS Economic Evaluation Database <3rd Quarter 2010>, British Nursing Index <1994 to August 2010>, EMBASE <1980 to 2010 Week 35>, MIDIRS: Maternity and Infant Care, PsycINFO <1987 to August Week 5 2010>

Search Strategy used:

1 (massage adj therap$).mp. (2067)
2 exp MASSAGE/ (12233)
3 (therapeutic adj touch).mp. (1482)
4 exp TOUCH/ or exp THERAPEUTIC TOUCH/ (54055)
5 (tactile adj stimulation).mp. (5975)

S11	S9 and S10	Search modes - Boolean/Phrase	Interface - EBSCOhost Search Screen - Advanced Search Database - CINAHL with Full Text	24
S10	(MH "Systematic Review") OR (MH "Literature Review+")	Search modes - Boolean/Phrase	Interface - EBSCOhost Search Screen - Advanced Search Database - CINAHL with Full Text	9225
S9	S7 and S8	Search modes - Boolean/Phrase	Interface - EBSCOhost Search Screen - Advanced Search Database - CINAHL with Full Text	3348
S8	S1 or S2 or S3 or S4 or S5 or S6	Search modes - Boolean/Phrase	Interface - EBSCOhost Search Screen - Advanced Search Database - CINAHL with Full Text	32168
S7	TX infant$ or baby or babies	Search modes - Boolean/Phrase	Interface - EBSCOhost Search Screen - Advanced Search Database - CINAHL with Full Text	125592
S6	TX tactile stimulation	Search modes - Boolean/Phrase	Interface - EBSCOhost Search Screen - Advanced Search Database - CINAHL with Full Text	523
S5	TX touch	Search modes - Boolean/Phrase	Interface - EBSCOhost Search Screen - Advanced Search Database - CINAHL with Full Text	26475
S4	(MH "Touch") OR (MH "Therapeutic Touch")	Search modes - Boolean/Phrase	Interface - EBSCOhost Search Screen - Advanced Search Database - CINAHL with Full Text	2453
S3	TX massage therapy	Search modes - Boolean/Phrase	Interface - EBSCOhost Search Screen - Advanced Search Database - CINAHL with Full Text	2566
S2	TX therapeutic touch	Search modes - Boolean/Phrase	Interface - EBSCOhost Search Screen - Advanced Search Database - CINAHL with Full Text	1697
S1	exp MASSAGE/ OR (MH "Massage+")	Search modes - Boolean/Phrase	Interface - EBSCOhost Search Screen - Advanced Search	0

Database - CINAHL with Full Text

6 (infant$ or baby or babies).mp. (1695078)
7 1 or 2 or 3 or 4 or 5 (67152)
8 6 and 7 (3248)
9 exp systematic review/ (35384)
10 systematic review.m_titl. (37491)
11 literature review.mp. [mp=ti, ot, ab, nm, hw, kw, ui, an, tx, sh, ct, de, tn, dm, mf, tc, id] (83384)
12 literature review.m_titl. (26695)
13 review.m_titl. (469427)
14 9 or 10 or 11 or 12 or 13 (540188)
15 8 and 14 (82)
16 remove duplicates from 15 (64)
17 limit 16 to yr="2000 -Current" [Limit not valid in DARE; **records were retained] (49)**

In CINAHL: (MH "Systematic Review") OR (MH "Literature Review+"); TX tactile stimulation, TX touch; TX infant$ or baby or babies; (MH "Touch") OR (MH "Therapeutic Touch"); TX massage therapy; TX therapeutic touch; exp MASSAGE/ OR (MH "Massage+").

Search strategy and results of CINAHL through NHS, EBSCO host were 24.

Appendix 2: Study Inclusion/Exclusion Results

Study inclusion/exclusion results performed by 3 reviewers:

Excluded publications with reasons for exclusion by publication/study type

	Publication	***Title and abstract by 3 reviewers independently + Reason for exclusion***	***Decision***	***Full text by 3 reviewers/ Reason for exclusion***	***Final decision***
1)	Adams, J.et al. (2009). Women's use of complementary and alternative medicine during pregnancy: A critical review of the literature. *Birth*	No different # population P & intervention I	No		
2)	Aita, M., & al (2003). Assessment of neonatal nurses' behaviours that prevent overstimulation in preterm infants. *Intensive & Critical Care Nursing,*	No # P & I	No		
3)	Anorlu, R. I., et al (2008). Methods of delivering the placenta at caesarean section. *Cochrane Database of Systematic Reviews*	No # P & I	No		
4)	Beebe, B., et al. (2010). The origins of 12-month attachment: A microanalysis of 4-month mother-infant interaction. *Attachment & Human Development, 12*(1-2), 3-141.	no wrong P & I	No		
5)	Blackwell, P. L. (2000). The influence of touch on child development: Implications for intervention. *Infants & Young Children: An Interdisciplinary Journal of Special Care Practices, 13*(1), 25-39.	No # P	No		
6)	Bowden, V. R., et al (2000). Developmental care of the newborn. *Online Journal of Clinical Innovations, 3*(7), 1-77.	No # P	No		
7)	Beal, J. A. (2005). Evidence for best practices in the neonatal period. *MCN*	No # P	No		
8)	Beider, S., & Moyer, C. A. (2007). Randomized controlled trials of pediatric massage: A review. *Evidence-Based Complementary and Alternative Medicine, 4*(1), 23-34.	Maybe, No # population	Check full text	Not Review, not preterm infants	did not include pre-term infants
9)	Breuner, C. C. (2002). Complementary medicine in paediatrics: A review of acupuncture, homeopathy, massage, and chiropractic therapies. *Current Problems in Paediatric and Adolescent Health Care*	Maybe, no # population	Check full text	hard copy only	not pre-term infants
10)	Carfoot, S., Williamson, P. R., & Dickson, R. (2003). A systematic review of randomised controlled trials evaluating the effect of mother/baby skin-to-skin care on successful breast feeding. *Midwifery*	No # intervention	No		
11)	Chen, L., et al (2008). Acupressure and meridian massage: Combined effects on increasing body weight in premature infants [corrected] [published erratum appears in J CLIN NURS 2008 aug;17(15):2089].	not systematic review	No		not a systematic review
12)	Centre for Reviews and Dissemination. (2010). An integrative review and meta-analysis of therapeutic touch research	No	Check full text		

	(structured abstract). *Database of Abstracts of Reviews of Effects,* (3)				
13)	Centre for Reviews and Dissemination. (2010). A review of nursing interventions to foster becoming a mother (structured abstract). *Database of Abstracts of Reviews of Effects,* (3)	No # P	No		
14)	Centre for Reviews and Dissemination. (2010). Systematic review of treatments for atopic eczema (structured abstract). *Database of Abstracts of Reviews of Effects*, (3)	no # P & I	No		
15)	Cignacco E et al (2007). The efficacy of non-pharmacological interventions in the management of procedural pain in preterm and term neonates. A systematic literature review. European Journal of Pain Feb;11(2):139-52.	Yes	Check full text	No different Intervention	interventions does not include massage and/or kinaesthetic stimulation
6)	Complementary medicine - general.(2010). *Focus on Alternative and Complementary Therapies, 15*(2), 159-162.	No	No		
17)	de Roiste, A. (2004). TAC-TIC therapy with premature infants: A series of investigative studies. *Neuroendocrinology Letters, 25*(SUPPL. 1), 67-77.	No	No		
18)	Dennis, C. L. (2004). Treatment of postpartum depression, part 2: A critical review of non-biological interventions. *The Journal of Clinical Psychiatry, 65*(9), 1252-1265.	no # P & I	No		
19)	Dennis, C. -., & Allen, K. (2008). Interventions (other than pharmacological, psychosocial or psychological) for treating antenatal depression. *Cochrane Database of Systematic Reviews*	no # P & I	No		
20)	Diego, M. A., Field, T., & Hernandez-Reif, M. (2005). Vagal activity, gastric motility, and weight gain in massaged preterm neonates. *Journal of Paediatrics, 147*(1), 50-55.	no Not Systematic review	No		not a systematic review
21)	Dodd, J. M., & Crowther, C. A. (2006). Cochrane reviews in pregnancy: The role of perinatal randomized trials and systematic reviews in establishing evidence. *Seminars in Foetal and Neonatal Medicine*	no # P & I	No		
22)	Ernst, E. (2003). Serious adverse effects of unconventional therapies for children and adolescents: A systematic review of recent evidence. *European Journal of Paediatrics, 162*(2), 72-80.	no # P & I	Check full text	No - not review of RCTs	No
23)	Field T. Diego M. HernandezReif,M. (2010). Preterm infant massage therapy research: A review. *Infant Behaviour and Development. Vol 33, no 2, 2010, Pp 115-124,*	No not syst rev	Check full text	Not systematic review	No
24)	Field, T. (2010). Postpartum depression effects on early interactions, parenting, and safety practices: A review. *Infant Behaviour and Development, 33*(1), 1-6.	no # P & I	No		
25)	Duplicate				

26)	Galligan, M. (2006). Proposed guidelines for skin-to-skin treatment of neonatal hypothermia. *MCN the American Journal of Maternal/Child Nursing, 31*(5), 298-306.	no # P & I	No		
27)	Ganz, M. L. (2007). The lifetime distribution of the incremental societal costs of autism. *Archives of Paediatrics and Adolescent Medicine, 161*(4), 343-349.	no # P & I	No		
28)	Giglio, P., Undevia, N., & Spire, J. -. (2005). The primary parasomnias: A review for neurologists. *Neurologist, 11*(2), 90-97.	no # P & I	no		
29)	Gonzalez, A. P., et al (2009). Weight gain in preterm infants following parent-administered vimala massage: A randomized controlled trial. *American Journal of Perinatology*	not systematic review	No		
30)	Grattan, M. P., et al (2005). Sex differences in high-risk premature infants' asymmetric movement development. *Physical & Occupational Therapy in Paediatrics*.	No # intervention	No		
31)	Harris, P., & Rees, R. (2000). The prevalence of complementary and alternative medicine use among the general population: A systematic review of the literature. *Complementary Therapies in Medicine*	no # P & I	No		
32)	Harrison, L., Berbaum, M. L., Stem, J. T., & Peters, K. (2001). Use of individualized versus standard criteria to identify abnormal levels of heart rate or oxygen saturation in preterm infants. *Journal of Nursing Measurement, 9*(2), 181-200.	no # P & I	No		
33)	Harrison, L. L., Williams, A. K., Berbaum, M. L., Stem, J. T., & Leeper, J. (2000). Physiologic and behavioural effects of gentle human touch on preterm infants. *Research in Nursing & Health, 23*(6), 435-446.	No, not systematic review	No		
34)	Harvey, S., Snowdon, C., & Elbourne, D. (2008). Effectiveness of bereavement interventions in neonatal intensive care: A review of the evidence. *Seminars in Foetal & Neonatal Medicine, 13*(5), 341-356.	no # P & I	No		
35)	Hazzard, M. E. (2004). Review of complementary therapies as adjuncts in the treatment of postpartum depression. *Complementary Health Practice Review, 9*(3), 215.	no # P & I	No		
36)	Hertenstein, M. J., Verkamp, J. M., Kerestes, A. M., & Holmes, R. M. (2006). The communicative functions of touch in humans, nonhuman primates, and rats: A review and synthesis of the empirical research. *Genetic, Social, and General Psychology Monographs, 132*(1), 5-94.	No	No		
37)	Hou, W. -., Chiang, P. -., Hsu, T. -., Chiu, S. -., & Yen, Y. -. (2010). Treatment effects of massage therapy in depressed people: A meta-analysis. *Journal of Clinical Psychiatry, 71*(7), 894-901.	No # population	No		
38)	Ireland, M., & Olson, M. (2000). Massage	Yes	Check	Yes include	not a

	therapy and therapeutic touch in children: State of the science. *Alternative Therapies in Health and Medicine, 6*(5), 54-63.		full text		systematic review
39)	Jindal, V., Ge, A., & Mansky, P. J. (2008). Safety and efficacy of acupuncture in children: A review of the evidence. *Journal of Paediatric Haematology/Oncology, 30*(6), 431-442.	no # P & I	No		
40)	Kim, T. I., Shin, Y. H., & White-Traut, R. (2003). Multisensory intervention improves physical growth and illness rates in Korean orphaned newborn infants. *Research in Nursing & Health, 26*(6), 424-433.	No # P	No		
41)	Lago, P., Garetti, E., Merazzi, D., Pieragostini, L., Ancora, G., Pirelli, A., et al. (2009). Guidelines for procedural pain in the newborn. *Acta Paediatrica, International Journal of Paediatrics, 98*(6), 932-939.	no # P & I	No		
42)	Liaw, J. (2001). The state of science: Tactile stimulation and preterm infants... 34th annual communicating nursing research Conference/15th annual WIN assembly, "health care challenges beyond 2001: Mapping the journey for research and practice," held April 2001 in Seattle, Washington. *Communicating Ng Research*	No # P	No		
43)	Liu, W. F., et al (2007). The development of potentially better practices to support the neurodevelopment of infants in the NICU. *Journal of Perinatology*	No not a review	No		
44)	Massaro, A. N., Hammad, T. A., Jazzo, B., & Aly, H. (2009). Massage with kinaesthetic stimulation improves weight gain in preterm infants. *Journal of Perinatology, 29*(5), 352-357.	not systematic review	Check full text	No - RCT report	not a systematic review
45)	Misri, S., & Kendrick, K. (2007). Treatment of perinatal mood and anxiety disorders: A review. *Canadian Journal of Psychiatry, 52*(8), 489-498.	no # P & I	No		
46)	Misri, S., & Kendrick, K. (2008). Perinatal depression, foetal bonding, and mother-child attachment: A review of the literature. *Current aPediatric Reviews, 4*(2), 66-70.	no # P & I	No		
47)	Modrcin-Talbott, M., Harrison, L. L., Groer, M. W., & Younger, M. S. (2003). The bio behavioural effects of gentle human touch on preterm infants. *Nursing Science Quarterly, 16*(1), 60-67.	not systematic review	Check full text	No - RCT report	not a syst. review
48)	Obeidat, H., et al (2009). Use of facilitated tucking for nonpharmacological pain management in preterm infants: A systematic review. *Journal of Perinatal and Neonatal Nursing*	No different intervention	No		
49)	Ohgi, S.et al. (2002). Comparison of kangaroo care and standard care: Behavioral organization, development, and temperament in healthy, low-birth-weight infants through 1 year. *Journal of Perinatology*	No different intervention	No		
50)	Osborn, D. A., & Henderson-Smart, D.	Yes	Check	Different	Not massage

	(2002). Kinaesthetic stimulation for preventing apnea in preterm infants. *Cochrane Database of Systematic Reviews*, (2)		full text	intervention	and/or kinaesthetic stimulation
51)	Paquette, G., et al (2007). A systematic review of non-pharmacological pain management methods for premature infants. [Revue systematique des methodes non pharmacologiques de soulagement de la douleur chez les prematures.] *Douleur Et Analgesie*	No? French language article	Check full text	French article	French language
52)	Poets, C. F. (2010). Interventions for apnoea of prematurity: A personal view. *Acta Paediatrica, International Journal of Paediatrics*, *99*(2), 172-177.	not systematic review	No		
53)	Renckens, C. N. M., et al. (2005). Systematic review of the effects of therapy in infants with the KISS-syndrome (kinetic imbalance due to suboccipital strain) [1] (multiple letters). *Netherlands*	No # P and I	No		
54)	Renfrew, M. J., et al. (2009). Breastfeeding promotion for infants in neonatal units: A systematic review and economic analysis. *Health Technology Assessment*	No # I	No		
55)	Roberts, D. M., Ostapchuk, M., & O'Brien, J. G. (2005). Infantile colic. *South African Family Practice*, *47*(5), 22-26.	No # I	No		
56)	Rosen, L. D., Bukutu, C., Le, C., Shamseer, L., & Vohra, S. (2007). Complementary, holistic, and integrative medicine: Colic. *Paediatrics in Review*, *28*(10), 381-385.	No	No		
57)	Serrano, M., et al (2010). Teaching Chilean mothers to massage their full-term infants: Effects on maternal breast-feeding and infant weight gain at age 2 and 4 months. *Journal of Perinatal & Neonatal Nursing*	not systematic review	No		
58)	Shorvon, S. (2007). The treatment of chronic epilepsy: A review of recent studies of clinical efficacy and side effects. *Current Opinion in Neurology*, *20*(2), 159-163.	No # population and Intervention	No		
59)	Sizun, J., & Westrup, B. (2004). Early developmental care for preterm neonates: A call for more research. *Archives of Disease in Childhood -- Foetal & Neonatal Edition*, *89*(5), F384-9.	not systematic review	No		
60)	Storm, L., & Reese, S. O. (2005). Better beginnings through nurturing touch. *Zero to Three*, *26*(1), 14-18.	No # population	No		
61)	Teti, D. M., et al. (2009). Intervention with African American premature infants: Four-month results of an early intervention program. *Journal of Early Intervention*	not systematic review	No		
62)	Teng, C. L., Ng, C. J., Nik-Sherina, H., Zailinawati, A. H., & Tong, S. F. (2008). The accuracy of mother's touch to detect fever in children: A systematic review. *Journal of Tropical Paediatrics*, *54*(1), 70-73.	No # population and Intervention	No		
63)	Ter Steeg, A. M., et al (2003). Orthopaedic sequelae in neurogically recovered	No # P and I	No		

	obstetrical brachial plexus injury. case study and literature review. *Disability and Rehabilitation*				
64)	Tsao, J. C. I., et al (2008). A review of CAM for procedural pain in infancy: Part I. sucrose and non-nutritive sucking. *Evidence-Based Complementary and Alternative Medicine*	No # I	No		
65)	Tsao, J. C. I., et al (2008). A review of CAM for procedural pain in infancy: Part II. other interventions. *Evidence-Based Complementary and Alternative Medicine*	No	No		
66)	Underdown A. Barlow J. StewartBrown,S. (2010). Tactile stimulation in physically healthy infants: Results of a systematic review. *Journal of Reproductive and Infant Psychology. Vol 28, no 1, 2010, Pp 11-29,*	Maybe, No # population	Check full text	No - not preterm infant	
67)	Duplicate				
68)	Underdown, A., Barlow, J., Chung, V., & Stewart-Brown, S. (2006). Massage intervention for promoting mental and physical health in infants aged under six months. *Cochrane Database of Systematic Reviews*	No # population only full term	No		not pre-term infants
69)	Duplicate				
70)	Vaivre-Douret, L., et al (2009). The effect of multimodal stimulation and cutaneous application of vegetable oils on neonatal development in preterm infants: A randomized controlled trial. *Child: Care, Health & Development*	not systematic review	No		
71)	Vickers, A., Ohlsson, A., Lacy, J., & Horsley, A. (2004). Massage for promoting growth and development of preterm and/or low birth-weight infants. *Cochrane Database of Systematic Reviews*, (2)	Yes	include	Yes include	Yes
72)	Winberg, J. (2005). Mother and newborn baby: Mutual regulation of physiology and behaviour - A selective review. *Developmental Psychobiology, 47*(3), 217-229.	No # population	No		
73)	Zack, E.et al(2009). Infant imitation from television using novel touch screen technology. *British Journal of Developmental Psychology*	not pre-term/LBW infants	No		
74)	Zealey, C. (2005). The benefits of infant massage: A critical review. *Community Practitioner*	Yes	check full text	Not systematic review	not a systematic review

Example of the study inclusion/exclusion decision making after looking for full text

If Reviewers reply	1st reviewer	2nd reviewer	3rd reviewer	Decision for inclusion/exclusion	Reasons for exclusion
	Yes	Yes	Yes	Yes	
	Yes	Maybe	No	Look at Full text	Not a systematic review
	No	Maybe	No	Look at Full text	Different population
	Yes	Yes	Maybe	Look at Full text	Different intervention

Appendix 3: Final Decision for Full text Retrieval

1. Massaro 2009: Not Systematic review
2. Modrcin-Talbott 2003: Not Systematic review
3. Underdown 2006: Not pre-term
4. Field et al. 2010: Not Systematic review
5. Beider & Moyer 2007: Not pre-term
6. Chen 2008: Not Systematic review
7. Diego 2005: Not Systematic review
8. Harrison et al. 2000: Not Systematic review
9. Paquette et al. 2007: French language
10. Breuner, C. C. (2002): Different population not premature or LBW infants
11. Zealey 2005: Not Systematic review
12. Cignacco E et al (2007): Interventions does not include massage and/or kinesthetic stimulation
13. Osborn & Henderson-Smart 2002: Interventions does not include massage and/or kinesthetic stimulation (only oscillating mattresses or other repetitive stimulation involving moving the baby).
14. Ireland, M., & Olson, M. (2000): Not Systematic review
15. Vickers et al. 2004: Systematic review

Final decision: Include Vickers et al. 2004

Appendix 4: CASP Checklist

The CASP is a standardized checklist of 10 questions (Higgings et al 2003; Oxman et al 1994) for critically appraising Vickers, A., Ohlsson, A., Lacy, J., & Horsley, A. (2004) review performed by two reviewers independently, with agreement reached by consensus:

Item **Answer Yes No**
Critical Appraisal Skills Programme (CASP). The 10 questions are adapted from Oxman AD, Cook DJ, Guyatt GH, Users' guides to the medical literature. VI. How to use an overview. JAMA 1994; 272 (17): 1367-1371
Title of the study: Massage for promoting growth and development of preterm and/or LBW infants (Review) Is the study valid? yes **What are the results?** **Massage improved daily weight gain, reduce length of stay by 4.5 days and have a slight positive effect on postnatal complications and weight at 4 - 6 months, no evidence that gentle still touch is of benefit.** **Will the results help locally? Yes**
1. Did the review ask a clearly-focused question? Population, Intervention, Outcome. **yes**
2. Did the review include the right type of study?
– address the review's question yes
– have an appropriate study design yes
3. Did the reviewers try to identify all relevant studies?
– which bibliographic databases were used: The Cochrane Library, MEDLINE, EMBASE, Psychlit, CINAHL and Dissertation Abstracts International & citation tracking
– if there was follow-up from reference lists yes
– if there was personal contact with experts yes
– if the reviewers searched for unpublished studies yes
– if the reviewers searched for non-English-language studies yes
4. Did the reviewers assess the quality of the included studies?
– if a clear, pre-determined strategy was used to determine which studies were included. Look for:
– a scoring system: Yes
– more than one assessor: yes
5. If the results of the studies have been combined, was it reasonable to do so?
– the results of each study are clearly displayed: yes
– the results were similar from study to study (look for tests of heterogeneity): no
– the reasons for any variations in results are discussed yes
6. How are the results presented, and what is the main result?
– how the results are expressed (e.g. odds ratio, relative risk, etc.) weighted mean difference (WMD) 95% CI. Rubbing, stroking and kinaesthetic stimulation gained more weight per day than controls
– how large this size of result is and how meaningful it is: improved daily weight gain 5g/day, 4.5 days shorter stay
– how you would sum up the bottom-line result of the review in one sentence: **small effect and many study flaws.** *For medically stable infants massage has a very low risk of adverse effects,*

Wt gain 5g/day, 4.5 days shorter stay.
7. How precise are these results? Not very precise, concerns about blinding, randomization, sample sizes and selective reporting, effect sizes were of minor clinical significance
– if a confidence interval were reported. Would your decision about whether or not to use this intervention be the same at the upper confidence limit as at the lower confidence limit? No
– if a p-value is reported where confidence intervals are unavailable: yes
8. Can the results be applied to the local population? Yes
– the population sample covered by the review could be different from your population in ways that would produce different results same population
– your local setting differs much from that of the review: Yes
– you can provide the same intervention in your setting: Yes possible
9. Were all important outcomes considered?
– individual yes
– policy makers and professionals no
– family/carers no
– wider community no
10. Should policy or practice change as a result of the evidence contained in this review? No further research needed
– Whether any benefit reported outweighs any harm and/or cost. If this information is not
reported can it be filled in from elsewhere? cannot tell

Appendix 5: Evaluation and Grading Elements

According to the GRADE scheme (Guyatt et al, 2011), evaluation and grading are based on the following elements described below:

1. Risk of bias: the risk of bias in studies decreases the confidence in the estimate of the effect.
2. Imprecision: Results are imprecise when studies have wide confidence intervals around the estimate of the effect relative to the minimal important difference, because they included relatively few patients and few events (Results should be presented precisely with appropriate statistical testing).
3. Inconsistency: when heterogeneity (inconsistency) of results is not well explained.
4. Indirectness: means that research does not directly compare the interventions of interest to the populations of interest, and it does not measure the important outcomes to clients. Noting that any indirectness such as: differences in study population, intervention, comparator or outcomes, between the available evidence and the clinical question, may affect the quality of evidence. Another important type of indirectness is when we do not have comparisons between two or more interventions of interest (head-to-head).
5. Publication bias: is a systematic underestimate or overestimate of the underlying beneficial or harmful effect, due to the selective publication of results. Publication bias occurs when the results of published studies are not representative of results of all completed studies. Studies with significant results are more likely to be published than studies with negative or no results.

The four GRADE quality levels: ‘high’, ‘moderate’, ‘low’ and ‘very low’” are described as follows:

-High means further research is very unlikely to change our confidence in the estimate of effect.
-Moderate means further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate.
-Low means further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate.
-Very low means any estimate of effect is very uncertain.

Appendix 6: Details of Searches

Search number 1:

Subjects: Evaluating massage intervention techniques and outcomes on premature/LBW infants.

Keywords/ MeSH headings used: For the concept "massage", MEDLINE was searched through PubMed, using the following MeSH terms "massage" OR "touch" to represent the intervention of interest. For the concept "premature baby", "infant, premature" OR "infant, newborn" OR "infant" OR "infant, low birth weight" was used to represent the population of interest (See table 2 for keywords and MeSH terms used). The investigator filtered the results according to "massage" AND "infant" and removed duplicates. The limits applied are: Years 2000 onwards and English language. Other terms used to locate qualitative studies were: focus groups, in-depth or semi-structured interviews and thematic or content or framework analysis. Likewise, it was also helpful to search reference lists of relevant studies.

MeSH terms and Keywords used:

MASSAGE		**PREMATURE**	
Medical Subject Headings (MeSH)	**Keywords**	**Medical Subject Headings (MeSH)**	**Keywords**
Touch	Touch*	Infant, Premature	Infant*
Massage	Tactile stimulation	Infant, Low Birth Weight	Prematur*
	Kinaesthetic stimulation		Infant
	Tactile Sense		Low Birth Weight*
	Physical Contact		Newborn*
	Tactual stimulation		Bab*
	Massag*		Child*
	Swedish Massage		
	Massage Therapy		

Keyword searches and their derivatives were performed on CINAHL, Cochrane, and PsycINFO. The above search strategy is from Medline (MeSH) with search terms expanded.
Date: April 20, 2012
Language: English
*Truncation mark
The searches in the above databases are performed using the same Keywords/Mesh terms as appropriate.

Search number 2:

Supplementary search was done following PICO approach and using the following keywords/MeSH terms: NICU, premature infant/LBW, parent/parental. Results from 4 databases are as follows:

- Medline (10 results),
- CINAHL and Academic Search Premier (46 results), and
- JSTOR (96 results)

Total =141 after removal of duplicates. The four main interventions that were found to be effective in NICU are Kangaroo Mother Care KMC, Creating Opportunities for Parent

Empowerment COPE, Skin to skin care SSC, and *Developmental Care and Assessment Program* (*NIDCAP*).

Search number 3:

SPIDER search suggested by Cooke, Smith, and Booth, 2012 to capture more qualitative research as follows:
S- Sample: "parent*" OR "mother*" OR "father*" OR "nurse" OR "caregiver" OR infant, premature OR bab* OR infant* OR newborn* OR Infant, Low Birth Weight OR child*
PI- phenomenon of interest: "massag*" or" Touch*" or "Tactile stimulation"
D-design: "questionnaire*" OR "survey*" OR "interview*" OR "focus group*" OR "case stud*" OR "observ*"
E-evaluation: "view*" OR "experienc*" OR "opinion*"OR "attitude*" OR "perce*" OR "belie*" OR "feel*" OR "know*" OR "understand*" OR "factors"
R-research type: "qualitative" OR "mixed method*"

Or by Using PICO for Concepts search in databases

1. Infant, premature* OR Infant* OR Low Birth Weight* OR bab* OR child* OR newborn* OR parent* OR mother* OR father* OR nurse OR caregiv* OR physical therap*
2. massag* OR Touch* OR Tactile stimulation OR stimlat*
3. Factor* OR facilitat* OR promot* OR improv* OR influenc*OR increase* OR barrier* OR affect* OR decreas*OR imped*
4. NICU OR neonatal care OR intensive care OR neonatal intensive care OR nurser* OR context* OR setting* OR institution* OR environment*

Medline search using PICOS search through UOB with truncation
Search: **((touch OR massage)) AND (("Infant, Premature"[Mesh]) OR ("Infant, Low Birth Weight"[Mesh] OR "Infant, Very Low Birth Weight"[Mesh] OR "Infant, Extremely Low Birth Weight"[Mesh]))**

1. Infant, premature (mesh) or (prematur* adj2 infant*) or bab* or newborn* or child* or infant* or Infant, Low Birth Weight (mesh) or (low birth weight* adj2 infant*)
2. massage (mesh) or keywords for massage: massag* or reflexolog* or (body adj2 work*) or rolfing* or (zone* adj2 therap*) or touch (mesh) or keywords for touch: touch* or taction* or tactile* or (physical adj3 stimul*)
3. Factor* or facilitat* or promot* or improv* or influenc* or increas* or barrier* or affect* or decreas* or imped*
4. qualit* or mixed method* or interview* or focus group* or case stud* or observ*

Example of Search Results:

Example 1

Ovid Technologies, Inc. Email Service----------Search for: 10 and 11Results: 12

Database: Ovid MEDLINE(R) <1946 to January Week 2 2014> Search Strategy: 17-1 2014
---

1 Massage/ae, cl, ct, ed, ma, mt, mo, nu, og, px, st, tu, th, td, ut [Adverse Effects, Classification, Contraindications, Education, Manpower, Methods, Mortality, Nursing, Organization & Administration, Psychology, Standards, Therapeutic Use, Therapy, Trends, Utilization] (1545)
2 ((prematur* adj2 infant*) or bab* or newborn* or child*).mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier] (2221108)
3 (low birth weight* adj2 infant*).mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier] (23008)
4 (massag* or reflexolog* or (body adj2 work*) or rolfing* or (zone* adj2 therap*)).mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading

word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier] (12108)
5 (touch* or taction* or tactile* or (physical adj3 stimul*)).mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier] (50189)
6 (factor* or facilitat* or promot* or improv* or influenc* or increas* or barrier* or affect* or decreas* or imped*).mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier] (8208121)
7 1 or 4 or 5 (61801)
8 2 or 3 (2221411)
9 7 and 8 (6961)
10 6 and 9 (3614)
11 (((qualit* or mixed) adj2 method*) or interview* or focus group* or case stud* or observ*).mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier] (2459102)
12 10 and 11 (831)

****

Example 2:
JSTOR search strategy

Another updated search was done to capture qualitative studies 18 1 2014 (584)

(((((Infant, premature OR newborn OR infant OR LBW) AND (massag OR touch OR tactile OR physical stimul)) AND (facilitat OR barrier OR imped)) AND (qualit OR interview OR focus group OR case stud)) AND (NICU OR neonatal care OR intensive care OR neonatal intensive care)) AND (cty:(journal) AND ty:(fla OR brv OR edi OR nws OR mis)) AND la:(eng)

Example 3:

POPLINE Advanced Search 18-1-2014 (179)

All Fields

Infant, premature OR newborn OR infant OR LBW
massag OR touch OR tactile OR physical stimul
qualit OR interv OR focus group
Language English

Example 4:

Database: EBSCO CINAHL Search Strategy: 18-1 2014

1. (Infant, premature* OR Infant* OR Low Birth Weight* OR bab* OR child* OR newborn* OR parent* OR mother* OR father* OR nurse OR caregiv* OR physical therap*) AND (S1 AND S2 AND S3 AND S4)

http://search.ebscohost.com/login.aspx?direct=true&db=rzh&bquery=(Infant%2c+premature*+OR+Infant*+OR+Low+Birth+Weight*+OR+bab*+OR+child*+OR+newborn*+OR+parent*+OR+mother*+OR+father*+OR+nurse+OR+caregiv*+OR+physical+therap*)+AND+(((massag*+OR+reflexolog*+OR+(body+N%3d2+work*)+OR+rolfing*+OR+(zone*+N%3d2+therap*))+OR+(touch*+OR+taction*+OR+tactile*+OR+(physical+N%3d3+stimul*)))+AND+(Factor*+OR+facilitat*+OR+promot*+OR+improv*+OR+influenc*+OR+increas*+OR+barrier*+OR+affect*+OR+decreas*+OR+imped*)+AND+(qualit*+OR+mixed+method*+OR+interview*+OR+focus+group*+OR+case+stud*+OR+observ*)+AND+(Infant%2c+premature*+OR+Infant*+OR+Low+Birth+Weight*+OR+bab*+OR+child*+OR+newborn*+OR+parent*+OR+mother*+OR+father*+OR+nurse+OR+caregiv*+OR+physical+therap*))&cli0=FR&clv0=Y&type=1&site=ehost-live&scope=site

Database	**Limiters Applied**
CINAHL Plus with Full Text References Available	
Print Search History CINAHL Plus	


Saturday, January 18, 2014 7:36:21 AM

#	Query	Limiters/Expanders	Last Run Via	Results
S7	(Infant, premature* OR Infant* OR Low Birth Weight* OR bab* OR child* OR newborn* OR parent* OR mother* OR father* OR nurse OR caregiv* OR physical therap*) AND (S1 AND S2 AND S3 AND S4)	Limiters - References Available Narrow by SubjectAge: - all infant Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL Plus with Full Text	80
S6	(Infant, premature* OR Infant* OR Low Birth Weight* OR bab* OR child* OR newborn* OR parent* OR mother* OR father* OR nurse OR caregiv* OR physical therap*) AND (S1 AND S2 AND S3 AND S4)	Limiters - References Available Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL Plus with Full Text	389
S5	(Infant, premature* OR Infant* OR Low Birth Weight* OR bab* OR child* OR newborn* OR parent* OR mother* OR father* OR nurse OR caregiv* OR physical therap*) AND (S1 AND S2 AND S3 AND S4)	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL Plus with Full Text	803
S4	Infant, premature* OR Infant* OR Low Birth Weight* OR bab* OR child* OR newborn* OR parent* OR mother* OR father* OR nurse OR caregiv* OR physical therap*	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL Plus with Full Text	729,690
S3	qualit* or mixed method* or interview* or focus group* or case stud* or observ*	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL Plus with Full Text	585,018
S2	Factor* or facilitat* or promot* or improv* or influenc* or increas* or barrier* or affect* or decreas* or imped*	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL Plus with Full Text	1,252,643
S1	(massag* or reflexolog* or (body N=2 work*) or	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases	20,563

	rolfing* or (zone* N=2 therap*)) OR (touch* or taction* or tactile* or (physical N=3 stimul*))		Search Screen - Advanced Search Database - CINAHL Plus with Full Text	

MeSH terms and Keywords used:

MASSAGE		**PREMATURE**	
Medical Subject Headings (MeSH)	**Keywords**	**Medical Subject Headings (MeSH)**	**Keywords**
Touch*	Touch*	Infant, Premature*	Infant, Premature*
Massage*	Tactile stimulation	Infant, Newborn	Infant
	Kinaesthetic stimulation	Infant, Low Birth Weight	Infant, Newborn
	Tactile Sense	Infant, Very Low Birth Weight	Child
	Physical Contact	Infant, Extremely Low Birth Weight	Infant, Low Birth Weight
	Tactual stimulation	Infant, Small for Gestational Age	Infant, Very Low Birth Weight
	Massage*		Neonat*
	Swedish Massage		Bab*
	Massage Therapy		Grower
			Late preterm

The above search strategy is from Medline (MeSH) with search terms expanded. Keyword searches and their derivatives were performed on CINAHL, Cochrane, and PsycINFO.
Date: April 20, 2012
Language: English
*terms expanded
I updated the search by using the Spider search suggested by Cooke, Smith, and Booth, 2012 to capture more qualitative research as follows in two databases Medline and CINAHL:
S- Sample: “parent*” OR “mother*” OR “father*” OR “nurse” OR “caregiver”
PI- phenomenon of interest: “massage” or” Touch” or “Tactile stimulation”
D-design: “questionnaire*” OR “survey*” OR “interview*” OR “focus group*” OR “case stud*” OR “observ*”
E-evaluation: “view*” OR “experienc*” OR “opinion*”OR “attitude*” OR “perce*” OR “belie*” OR “feel*” OR “know*” OR “understand*”
R-research type: “qualitative” OR “mixed method*”

Appendix 7: RSS Feeds- email awareness alerts from Journals and RSS Feeds from Data bases

This message contains My NCBI what's new results from the National Center for Biotechnology Information (NCBI) at the U.S. National Library of Medicine (NLM).
Do not reply directly to this message.

Sender's message:

Sent on Saturday, 2015 January 17
Search: ((touch OR massage)) AND (("Infant, Newborn"[Mesh]) OR ("Infant, Low Birth Weight"[Mesh] OR "Infant, Very Low Birth Weight"[Mesh] OR "Infant, Extremely Low Birth Weight"[Mesh]))
Limits: Humans, Clinical Trial, Letter, Meta-Analysis, Practice Guideline, Randomized Controlled Trial, Review, English, All Infant: birth-23 months, All Child: 0-18 years, Newborn: birth-1 month, Infant: 1-23 months

View complete results in PubMed (results may change over time).

Edit saved search settings, or unsubscribe from these e-mail updates.

Appendix 8: Selected Example of Search Results

Collating results as a selected example

All results were exported from the different databases to Refworks, when applicable, and a separate folder created for each database. Then, exact and close duplicates were removed. Finally, the results were exported as tab delineated and saved as text document, and copied and pasted to: excel sheet.

Reference Type	Authors, Primary	Title Primary	Pub Year	Keywords	Abstract	Included Rev 1	Excluded /Reason for exclusion reviewer 1	Included Reviewer 2	Excluded /Reason for exclusion reviewer 2
Journal Article	Chang,S. -M;Sung,H. -C	Application of massage therapy in premature infant nursing care	2007	Massage therapy;Nursing;Premature infants	Massage therapy has been used in the care of premature infants for many years in western countries, and a significant body of research has already shown the effectiveness of massage therapy in significantly increasing body weight, decreasing infant hospital durations, enhancing bone formation, and improving behavior. Key considerations when applying massage therapy on premature infants include gestational age, body weight, and physical condition. Nurses can teach parents to administer massage therapy on their premature infants to enhance parent-child attachment and interaction.	yes? Opinion piece			DNMC -opinion

Appendix 9: Description of the Intervention

Moderate Pressure Massage (tactile stimulation with human hands) MPM is a gentle, slow stroking of parts of the body combined with or without kinaesthetic stimulation (passive exercises of the arms and legs), and with or without oil (Appendix 9 description of the intervention) on stable preterm infants.

(1) Field et al (1986) moderate pressure massage MPM and KS (Tactile/kinaesthetic T/K): The 15 minute stimulation sessions consisted of three standardized five-minute phases. Tactile stimulation was given during the first and third phases, and kinaesthetic stimulation was given during the middle phase. For the tactile stimulation, the neonate was placed in a prone position. After thorough hand scrubbing, the person providing stimulation placed the palms of his or her warmed hands on the infant's body through the isolate portholes. He then gently stroked with his or her hands for five, one-minute periods (12 strokes at approximately 5 seconds per stroking motion) over each region in the following sequence: (1) from the top of the head to the neck, (2) from the neck across the shoulders, (3) from the upper back to the waist, (4) from the thigh to the foot to the thigh on both legs, and (5) from the shoulder to the hand to the shoulder on both arms. The infant was then placed in a supine position for the subsequent kinaesthetic stimulation phase. This phase contained five, one-minute segments of six passive flexion/extension movements lasting approximately 10 seconds apiece for each arm, then each leg, and finally both legs together. The infant was then returned to a prone position for the final tactile stimulation phase in which the procedure was repeated. Prone MPM for 5 min, Supine KS for 5 min, Prone MPM for 5 min (Monday till Friday 3 times 15 min massage at 9, 11 and 1pm for 5 consecutive days).

Infant massage video by Field et al. (1987)

(2) Vimala McClure massage (2000) T/K has been used primarily in term infants and includes the full body divided into six anatomic regions: face, upper limbs, thorax, abdomen, lower limbs, and back. It ends with stretching of all limbs. Start with the face: massage upper lids with the thumbs outward, from the nose to the cheeks; slide the thumbs from the upper lip to the cheeks, then under the ears with index and middle finger from ears to the chin. Arms and hands: using circular movements massage armpit then slide the hands from the shoulder to the wrists; use twisting movements in opposite direction, gently turning each finger for a circular massage on the dorsum of the hands (Wrists, Chest, Abdomen Inverted U, Legs and feet, back). As for premature infants, there are some differences. According to Vimala, it is better to progress from simple relaxation by simple daily dose of warm touch and holding to massage. And to start by massaging the back, the place on baby's body that has been least invaded by using two to three fingers rather than the whole hand. In addition, better to use firm strokes with warm oil with the baby in cradle pose. This technique differs from the technique reported by Field et al (1986) by its systematic head-to-toe, supine-to-prone, and midline-to-periphery progression. Another important difference is that the technique reported by Field et al calls for momentary suspension of touch and massage at any sign of discomfort for the newborn for 15 seconds, while the Vimala massage only slows massage actions but breaks no skin contact at signs of discomfort, allowing the newborn to adapt.

(3) Vaivre-Douret 1997, 2003 T/K massage protocol: Stimulate all areas of the body with moderate pressure, moving from the abdomen to the thorax and shoulders, followed by one half of the body to cover the arm, hand, leg and foot, and then the other half of the body and a ventral reversal to massage the back, shoulders and nape of the neck, ending with a dorsal reversal to touch the head and face with kinaesthetic stimulation.

(4) Mathai et al (2001) T/K stimulation :

Tactile-kinesthetic stimulation in the form of a 'baby massage' was given by a trained person from day 3 of life for 5 consecutive days, and thereafter by the mother (who was taught the technique) until 40-42 weeks post-menstrual age. Stimulation was given three times a day. Sessions began 30-45 minutes after a feed in the morning, afternoon and evening. A small amount of mineral oil or powder was used to decrease friction and this was removed with cotton after the stimulation. The total duration of each session was 15 minutes (excluding time for recording physiologic parameters). If the baby started crying or passed urine or stools during the session it was temporarily stopped till the baby was comfortable again. Stimulation was given as follows:

Phase I: This was done in the prone position. Twelve firm strokes with palms of the hands of 5 seconds each, were provided in each area as follows: (a) Head from forehead hairline over scalp down to neck with alternate hands; (b) Neck from midline outwards with both hands simultaneously; (c) Shoulders from midline outwards with both hands simultaneously; and (d) Back from nape of neck down to buttocks with firm, long stroke with alternate hands.

Phase-II: This was done in the supine position. Twelve firm stroke with palms of the hands, of 5 seconds each, were provided in each area as follows: (a) Forehead – From midline, outwards with both hands simultaneously; (b) Cheeks – From side of nose, with both hands simultaneously in rotating and clockwise direction; (c) Chest – 'butterfly' stroking from midline upwards, outwards, downwards and inwards back to initiating point; (d) Abdomen – From the appendix, in a clock wise direction around abdomen avoiding the epigastrium and probes, with gentle strokes; (e) Upper limbs (each separately) – from shoulders to wrist using alternate hands for stroking; (f) Lower limbs (each separately) – from hips to ankles using alternate hands for stroking; (g) Palms – from wrist to finger tips using alternate hands for stroking; and (h) Soles – from heel to toe tips using alternate hands for stroking.

Phase-III: This was done in the supine position and consisted of passive flexion and extension movements of the limbs at each large joint (shoulder, elbow, hip, knee and ankle) as 5 events of 2 seconds each in each area.

Appendix 10: Research Question Applicability for Title and Abstract

Research question:

First Author	
Year	
Screener Initials	

1. Is study population: *preterm /LBW infant (less than 37 weeks gestation or weighing at least 1 500 gram but less than 2500 gram at birth)*

☐ NO → Exclude
☐ Yes → go to the next question

2. Is intervention: *Focuses on massage* or massage combined with kinaesthetic stimulation?*

☐ NO → Exclude
☐ Yes → go to the next question

3. Is comparison: *routine / standard care or no intervention, or other treatment options?*

☐ NO → Exclude
☐ Yes → go to the next question

*Moderate Pressure Massage (tactile stimulation with human hands) MPM is a gentle, slow stroking of parts of the body combined with or without kinaesthetic stimulation (passive exercises of the arms and legs), and with or without oil

Appendix 11: Full-text Screening Form

First Author	
Year	
Screener Initials	

1. Is study population: *preterm /LBW infant (less than 37 weeks gestation or weighing at least 1500 gram but less than 2500 gram at birth)*
   - ☐ NO → Exclude
   - ☐ Yes → go to the next question

2. Is intervention: *Focuses on massage* or massage combined with kinaesthetic stimulation?*
   - ☐ NO → Exclude
   - ☐ Yes → go to the next question

3. Is comparison: *routine / standard care or no intervention, or other treatment options?*
   - ☐ NO → Exclude
   - ☐ Yes → go to the next question

4. Report on clinical outcome of interest: *Focuses on any physiological, clinical, behavioural or psyc hosocial outcomes such as weight gain, parent-infant interaction, breastfeeding initiation and duration, a nd length of stay?*
   - ☐ NO → Exclude
   - ☐ Yes → Include

Reason for exclusion (please check):

- ☐ Population not LBW infants and / or preterm
- ☐ Intervention not massage care
- ☐ Comparison not routine / standard care or no intervention, or other treatment options
- ☐ Outcome not physiological, clinical, behavioural or psychosocial
- ☐ Different reports for the same study as duplicate publications
- ☐ Other

3rd reviewer needed *(no consensus between 2 reviewers):* _____

*Moderate Pressure Massage (tactile stimulation with human hands) MPM is a gentle, slow stroking of parts of the body combined with or without kinaesthetic stimulation (passive exercises of the arms and legs), and with or without oil

Appendix 12: Data Extraction and Quality Assessment Form Infant Massage Integrative review- For Quantitative Studies

Screener initials: _____ Study ID: _____
Author, year: _____, _____ Type of publication: _____

1. Article title: _____ Source of funding:_____

2. Methodological characteristics of the study:

Type of study design: (Tick the appropriate one)

Studies were ranked according to the following hierarchical order by Centre for Reviews and Dissemination (2008).

( ) Experimental studies (randomized control trials)
( ) Quasi-experimental studies (experimental study without randomization)
( ) Controlled observational studies (cohort studies, case control studies)
( ) Observational studies without control (cross-sectional studies, case studies, pre and post intervention studies, qualitative studies)
( ) Other specify ----------
( ) Can't tell ----------

3. Methodological quality assessment (for qualitative studies go to P. 6 and 7)

With experimental studies there is a need to check the following criteria: selection bias (randomization to study groups); performance bias (blinding care-providers to decrease differences in care provided to study groups); attrition bias (all participants who entered in the study are accounted for in the results and 'intention to treat' analysis); and detection bias (blinding assessors to study group allocation).

Quality assessment tool for experimental studies (taken from McInnes & Chambers, 2008)

Author: Title:				
Methods Quality Assessment Criteria	**Fully met**	**Partially met**	**Not met**	**Not applicable**
1 Clear aims/hypotheses and objectives				
2 Clear description of intervention				
3 Recruitment method given				
4 Sample size/power calculations given				
5 Population demographics given				
6 Explicit inclusion/exclusion criteria				
7 Baseline characteristics statistically equal				
8 Method of allocation described				
9 Blinding of researchers				
10 Blinding of Care providers/data collector				
11 Groups treated equally aside from intervention				
12 Data recorded and presented in detail				
13 Complete follow-up with drop-				

	outs fully explained				
14	Attrition rate given for both control and experimental group				
15	Analysis by intention to treat (N/A for older studies)				
16	Analysis appropriate and details given				
17	Conclusions substantiated by data				
18	Limitations of study discussed				
19	Definition of massage				

To assess the methodological quality of each study items, the scores are as follows:
'fully met' = +1
'partially met' = +0.5
'not met' = -1
'not applicable' = 0

The scores of all applicable items will be totaled, and the percentage score will be derived by dividing the total by the number of applicable items. For example if a study did not meet the criteria for sample size calculation, partially met the criteria for demographic data (e.g. some of the characteristics of interest may be missing such as 'age'), and fully met the remaining criteria with the exception of the item 'analysis by intention to treat' which was not applicable (e.g. for older studies), then the Quality Assessment % would be:

16 (fully met) + 0.5 (1 partially met) -1 (not met) = 15.5 divided by 18 (19 - 1 item N/A) = 15.5/18 = 86%

(This means it is possible for studies of poor methodological quality to have a negative quality rating.)

Then papers are grouped by quality as follows:
Studies are graded as **good** where they scored: >70%
Studies are graded as **intermediate** where they scored: 50–69%
Studies are graded as **poor** where they scored: <50%

Implications

4. What are the recommendations of the author _____
5. Quality rating_____

With both reviewers discussing the ratings:
Is there a discrepancy between the two reviewers with respect to the component ratings?
NO YES

If yes, indicate the reason for the discrepancy
1- Oversight
2- Differences in interpretation of criteria
3- Differences in interpretation of study

Final Decision of both reviewers (circle one)
1- Good
2- Intermediate
3- Poor

Example of Completed Quality assessment tool for experimental studies (taken from McInnes & Chambers, 2008)

Author: Diego 2005 Screener initials: BA Original study				
Methods Quality Assessment Criteria	**Fully met**	**Partially met**	**Not met**	**Not applicable**
1 Clear aims/hypotheses and objectives	X			
2 Clear description of intervention	X			
3 Recruitment method given	X			
4 Sample size/power calculations given	X			
5 Population demographics given	X			
6 Explicit inclusion/exclusion criteria	X			
7 Baseline characteristics statistically equal	X			
8 Method of allocation described	X			
9 Blinding of researchers	X			
10 Blinding of Care providers??/data collector		X		
11 Groups treated equally aside from intervention	X			
12 Data recorded and presented in detail	X			
13 Complete follow-up with drop-outs fully explained		X		
14 Attrition rate given for both control and experimental group	X			
15 Analysis by intention to treat (N/A for older studies)			X	
16 Analysis appropriate and details given	X			
17 Conclusions substantiated by data	X			
18 Limitations of study discussed			X	
19 Definition of massage	X			

To assess the methodological quality of each study items, the scores are as follows:
'fully met' = +1
'partially met' = +0.5
'not met' = -1
'not applicable' = 0

The scores of all applicable items will be totaled, and the percentage score will be derived by dividing the total by the number of applicable items. For example if a study did not meet the criteria for sample size calculation, partially met the criteria for demographic data (e.g. some of the characteristics of interest may be missing such as 'age'), and fully met the remaining criteria with the exception of the item 'analysis by intention to treat' which was not applicable (e.g. for older studies), then the Quality Assessment % would be:
16 (fully met) + 0.5 (1 partially met) -1 (not met) = 15.5 divided by 18 (19 - 1 item N/A) = 15.5/18 = 86%

(This means it is possible for studies of poor methodological quality to have a negative quality rating.)

Then papers are grouped by quality as follows:

Studies are graded as **good** where they scored: >70%
Studies are graded as **intermediate** where they scored: 50–69%
Studies are graded as **poor** where they scored: <50%

The rating of studies as good, intermediate or poor is very important as it reflects the quality of the evidence.

Implications

6. What are the recommendations of the author ----------
7. Quality rating 12+2-3= 11/19= 57.8%

With both reviewers discussing the ratings:

Is there a discrepancy between the two reviewers with respect to the component ratings?

NO YES

If yes, indicate the reason for the discrepancy

4- Oversight
5- Differences in interpretation of criteria
6- Differences in interpretation of study

Final Decision of both reviewers (circle one)

4- Good
5- Intermediate
6- Poor

Appendix 13: Methodological Quality Assessment for Qualitative Studies (adapted from CASP and Dixon-Woods et al, 2004)

1. Were the objectives and research questions clear?	☐ fully met ☐ partially met ☐ not met ☐ not applicable
2. Were the qualitative methods research design suitable for exploration of research questions?	☐ fully met ☐ partially met ☐ not met ☐ not applicable
3. Was the theoretical framework adequate with respect to aim of the study? (If used)	☐ fully met ☐ partially met ☐ not met ☐ not applicable
3. Sample rationale was justified? Interviews, focus groups	☐ fully met ☐ partially met ☐ not met ☐ not applicable
5. Was strategy for data collection clearly stated?	☐ fully met ☐ partially met ☐ not met ☐ not applicable
6. Were principles and procedures for data organization and analysis fully described?	☐ fully met ☐ partially met ☐ not met ☐ not applicable
7. Were findings relevant with respect to aims of study?	☐ fully met ☐ partially met ☐ not met ☐ not applicable
8. Were data, interpretations and conclusions clearly integrated?	☐ fully met ☐ partially met ☐ not met ☐ not applicable
9. Were the findings transferable and useful?	☐ fully met ☐ partially met ☐ not met ☐ not applicable
10. Were ethical issues taken into consideration?	☐fully met ☐ partially met ☐ not met ☐ not applicable
MOST IMPORTANT DESIGN FLAWS:	

To assess the methodological quality of each study items, the scores are as follows:
'fully met' = +1; 'partially met' = +0.5; 'not met' = -1; 'not applicable' = 0

The scores of all applicable items will be totaled; the percentage score will be derived by dividing the total by the number of applicable items. For example if a study partially met the criteria for
'were the qualitative methods research design suitable for exploration of research questions" and fully met the remaining criteria then the Quality Assessment % would be:
9 (fully met) + 0.5 (1 partially met) = 9.5 divided by 10 = 9.5/10 = 95%

Then papers are grouped by quality as follows:
Studies are graded as **good** where they scored: >70%
Studies are graded as **intermediate** where they scored: 50–69%
Studies are graded as **poor** where they scored: <50%

Implications

1. What are the recommendations of the author _____
2. Quality rating_____
With both reviewers discussing the ratings:
Is there a discrepancy between the two reviewers with respect to the component ratings?
NO YES
If yes, indicate the reason for the discrepancy
1. Oversight
2. Differences in interpretation of criteria
3. Differences in interpretation of study

Final Decision of both reviewers (circle one)
1. Good
2. Intermediate
3. Poor

Example of Completed Data Extraction and Quality Assessment Form
Infant Massage Integrative review

Screener initials: _CBJ_____	Study ID: _____
Author, year: Lindrea and Stainton, 2000 US	Type of publication: photo case study

Article title: A CASE STUDY OF Infant Massage Outcomes

1. _____ Source of funding:_____

2. Methodological characteristics of the study:

Type of study design: (Tick the appropriate one)

Studies were ranked according to the following hierarchical order by Centre for Reviews and Dissemination (2008).

( ) Experimental studies (randomized control trials)
( ) Quasi-experimental studies (experimental study without randomization)
( ) Controlled observational studies (cohort studies, case control studies)
( ) Observational studies without control (cross-sectional studies, case studies, pre and post intervention studies, qualitative studies)
( ) Other specify ----------
(x) Can't tell ----------

Methodological quality assessment for Qualitative Studies (adapted from adapted from CASP and Dixon-Woods et al, 2004)

1. Were the objectives and research questions clear?	☐ fully met ☐ partially met x not met ☐ not applicable
2.Were the qualitative methods research design suitable for exploration of research questions?	☐ fully met ☐ partially met X not met ☐ not applicable
3. Was the theoretical framework adequate with respect to aim of the study? (If used)	☐ fully met ☐ partially met ☐ not met x not applicable
4. Sample rationale was justified? Interviews, focus groups	☐ fully met x partially met ☐ not met ☐ not applicable
5. Was strategy for data collection clearly stated?	☐ fully met ☐ partially met ☐ not met x not applicable
6. Were principles and procedures for data organization and analysis fully described?	☐ fully met ☐ partially met ☐ not met x not applicable
7. Were findings relevant with respect to aims of study?	☐ fully met ☐ partially met ☐ not met x not applicable
8. Were data, interpretations and conclusions clearly	☐ fully met

integrated?	☐ partially met x not met ☐ not applicable
9. Were the findings transferable and useful?	☐ fully met X partially met ☐ not met ☐ not applicable
10. Were ethical issues taken into consideration?	☐fully met ☐ partially met x not met ☐ not applicable

MOST IMPORTANT DESIGN FLAWS:

To assess the methodological quality of each study items, the scores are as follows:
'fully met' = +1; 'partially met' = +0.5; 'not met' = -1; 'not applicable' = 0

The scores of all applicable items will be totaled; the percentage score will be derived by dividing the total by the number of applicable items. For example if a study partially met the criteria for
'were the qualitative methods research design suitable for exploration of research questions" and fully met the remaining criteria then the Quality Assessment % would be:
9 (fully met) + 0.5 (1 partially met) = 9.5 divided by 10 = 9.5/10 = 95%

Then papers are grouped by quality as follows:
Studies are graded as **good** where they scored: >70%
Studies are graded as **intermediate** where they scored: 50–69%
Studies are graded as **poor** where they scored: <50%

Implications

3. What are the recommendations of the author -----exclude----------
4. Quality rating------poor----------
With both reviewers discussing the ratings:
Is there a discrepancy between the two reviewers with respect to the component ratings?
NO YES
If yes, indicate the reason for the discrepancy
1- Oversight
2- Differences in interpretation of criteria
3- Differences in interpretation of study

Final Decision of both reviewers (circle one)
1- Good
2- Intermediate
3- Poor

Appendix 14: Excluded Publications with Reasons of Exclusion

Nb	Publication (study) Author, citation and title	Abstract reviewed by two reviewers	Full text reviewed by two reviewers	Reason for exclusion R1	Reason for exclusion R2
	Bond, C. (2002, December). Positive touch and massage in the neonatal unit: a British approach. In *Seminars in neonatology* (Vol. 7, No. 6, pp. 477-486). WB Saunders.	**Yes**	**Yes**	**opinion article**	**Do not meet criteria DNMC**
	Cheung, N., & Song, Y. (2009). Effects of infant massage on physical growth and stress response in preterm babies. *Journal of Korean Academy of Child Health Nursing*, *15*(1), 71-80.	**Yes**	**No**	**Not English**	**not English Chinese**
	DE MADRES, P. A. R. T. I. C. I. P. A. C. I. Ó. N., & DEL NIÑO, P. E. E. C. (2007). THE PARTICIPATION OF PARENTS IN THE CARE OF PREMATURE CHILDREN IN A NEONATAL UNIT: MEANINGS ATTRIBUTED BY THE HEALTH TEAM1. *Rev Latino-am Enfermagem*, *15*(2), 239-46.	**Yes**	**Yes**	**Not massage**	**DNMC Not massage**

Appendix 15: Qualitative Studies Excluded from the Integrative Review with Critical Appraisal

Authors/ country	Study design/method	Population/setting/ intervention	Results	Strength/limitations
Lindrea and Stainton, 2000 US	Case study by photos	1 month old premature infant in NICU N=1 (Massage technique by Weiss 79)	Touch acceptance	The aims were not clearly stated Rationale for the design was not justified
Lappin and Kretschmer, 2005 US and Lappin, 2006 US	Case study with multiple, mixed research design phenomenological, ethnographic, and microethnographic approaches	11-month-old visually impaired infant N=1 Massage done at home (Technique McClure 1998)	Positive effect of massage on mother-infant interaction	Rationale for the design was well justified and Triangulation done
Moore, Gaitan and Asimakopoulou, 2007 UK	Qualitative grounded theory approach	8 mothers with low postnatal mood and their unsettled full term babies with colic who attended a massage course (Technique Field, 1986)	Positive effect of massage on mother-infant interaction	Rationale for the design and sampling were partially justified

The first two studies by Lappin and Kretschmer (2005) and Lappin (2006) described results of one case study published in two different articles. They explored the synchronous behaviors enacted by a Mexican American mother and her blind infant before and after teaching her infant massage at home (massage technique by McClure, 1998). They dealt with the dynamic interaction between a mother and her 11-month-old visually impaired infant before and after the mother applied infant massage at home. Lappin's studies suggested that massage is a communicative approach that strengthens parental bonds and acts as a developmental stimulant for visually impaired infant. The objectives were clearly stated and the methodology was well described and structured at each step. The participants were selected using specific purposive sampling method. Moreover, the data analysts chosen for the study did not have specific academic knowledge or training in attachment theory to ensure that their responses to the videotaped segments would be unbiased. A narrative-developmental approach was used throughout the study to investigate microscopically the development of relational and meaningful experiences. A multiple, mixed research design with different data generation methods The researchers used an emergent design that combined aspects of the phenomenological, ethnographic, and micro-ethnographic approaches in a natural setting.

The research focused on inductive analysis (interviews, videotaped observations, a focus group, and a panel discussion and narrative development) with description of the processes of the participants' meanings of mother-infant interaction before and after the intervention to develop a better understanding of the phenomenon of mother-infant attachment when the infant is visually impaired and after introducing infant massage. The findings were relevant with study aims which gives high credibility, transferability, and trustworthiness to the study. A case study is a recognized approach in qualitative studies. Although the issue of transferability is a concern, and so it is the case of all qualitative studies, it still is not ground for exclusion. However, the major criterion for excluding this study is that the infant is that massage was done at home. Therefore, contextual issues in applying or implementing massage in other settings still needs to be investigated.

The third by Moore et al (2007) explored the subjective experiences and personal attitudes towards infant massage, particularly of eight women who attended a health-visitor led infant massage course (massage technique by Field 1996) within the last six months of the study and who had a low postnatal mood. It used semi-structured interviews and a grounded theory approach that revealed the intertwined effects of massage on both mother and her full term infant. The inclusion criteria to recruit participants were not specific and well elaborated. Moore et al (2007) partially mentioned the rationale for choosing the grounded theory design with a convenient sample of only 8 participants. However, taking into consideration the context which is mothers with low postnatal mood and mothers who attended a massage course in the last six months, the number might be sufficient. It was limited to one-time semi-structured interviews to evaluate the effects of infant massage. Researchers did not come back to the field to confirm or generate new data about the phenomenon (i.e. no recurrent process was carried out). The evaluation was based only on the personal perception of mothers and did not include other tools for data collection in order to increase credibility of the generated data.

The fourth was a photo case study using illustration by Lindrea and Stainton (2000) of one episode infant massage in NICU (massage technique by Weiss 1979) by the nurse for a one month old premature infant that showed the behavioral change in the infant after massage; confirming the infant's transition from touch aversion to touch acceptance. In Lindrea and Stainton study (2000), the principles and procedures for data organization and analysis were not fully described. The objectives of this study were

not clearly stated. The inclusion criterion to recruit participants was not clear. The rationale for the design was not justified with few details of methodological process, for e.g. The technique and the timing of the massage intervention were not well explained. The author described the massage experience based only on photos at the beginning and at the end of the massage without having a clear research methodology. Moreover, the analysis was superficial (purely narrative) based only on personal influx of the researcher's feelings and poor interpretation of results. Therefore, there are limitations concerning rigour, transferability and relevance in the qualitative studies.

Appendix 16: Study Search Results for Studies Included, Detailing their Limitations

Study nb/Author Year Country	*Study design Hypotheses/ objectives*	*Funding*	*N*	*Participants' profile/age range Context*	*Intervention*	*By whom Mother/ Therapist/ trained person For how long*	*Outcome Measures*	*Results*	*Study Limitations*
1- Aly et al, 2004 Egypt	Double-blinded RCT pretest-posttest parallel design **Hypothesis** Massage combined with physical activity can stimulate bone formation and ameliorate bone resorption in premature infants	Not mentioned	N=30 IG=15 CG=15 Standard care	GA 28 to 35 weeks Massage started postnatal age less than 2 wks Infants tolerating full enteral feeds Not receiving medications except vitamins **Context** NICU Ain Shams University in Cairo, Egypt	**Massage protocol was adapted from Field et al, (1986) (1) composed of gentle, slow stroking of each part of the body in turn with kinesthetic stimulation.** Massage and Physical activity T/K was performed 15 min, 1x/day by the same physician (refer to footnote 1). Body weight was recorded daily at a standard time each day, before feeding	**Massage by physician** **For how long** **Not specified** until the infant reached 1.8 kg.	-P=Serum type I collagen C-terminal propeptide (PICP) and urinary pyridinoline crosslinks of collagen (Pyd) as indices for bone formation and resorption, respectively. -PICP and Pyd measured at enrollment and discharge for all subjects	Serum PICP increased in IG (regression coefficient 18.8±4.6, p=0.0001) in a Linear regression model including gestational age and intervention, Urinary Pyd did not differ between groups (p=0.961) Kruskal–Wallis Test was used to compare differences between IG and CG. A regression analysis was performed in order to control for gestational age since previous reports have suggested its correlation with PICP levels. t-test, ANOVA and linear regression analysis were used for statistical analyses.	**Paper** 1-Serum PICP Mean PICP concentration was higher in Group I (82.3±8.5 ng/ml) than in Group II (62.5±13.8 ng/ml) at the start of the study (p<0.001) 2-Explore other factors that affect PICP levels and could have explained the differences observed between the two groups of this study. **Reviewer** -Standard care was not adequately described -Duration of massage was not specified

2- Ang et *al, 2012 USA*	Randomised Complete Block Design **Hypothesis** **Primary hypothesis** was that MT would enhance the immune system of stable premature infants so that infants receiving MT would report a 35% increase in the proportion of NK cells (increase by 10% for infants in the CG). **Secondary hypotheses** were that compared with sham therapy, MT would enhance NK cytotoxicity, induce more rapid Wt gain, shorten LOS, and reduce the nb of culture-proven infections.	Funded by the National Institutes of Health/National Center for Complementary and Alternative Medicine	N=120 IG=58 CG= 62 Standard care	GA 28 to 33 weeks' postmenstrual age (PMA). Study entry criteria included medically stable premature infants with birth weight between 600and1800g Stability was defined as lack of need for supplemental oxygen, systemic antimicrobial therapy for infection, or a central line. Infants receiving human milk feedings were excluded (human milk is known to contain immune-related compounds) **Context** Hutzel Women's Hospital NICU.	**Intervention** **-Massage therapy protocol adapted from Field et al (1) (1986) with KS 15 min,** provided **3 X daily,** 5 days per week. Hands were washed thoroughly before and after contact with each infant. Gowns were also worn.	Massage by Neonatal research nurses who are certified in infant MT performed all study interventions (massage or sham) behind wide screens. **For how long** **Over 4 weeks or until hospital discharge** (whichever came first).	**Outcome measures** 1**. Primary outcome:** increase in proportion of NK cells. 2**.Secondary outcomes:** - Assessment of NK cytotoxicity, cellular immune function (T and B cells, T-cell subsets), - Wt gain -LOS -Number of culture-proven infections - Adverse events (AE)	Absolute NK cells were not different between the 2 groups. NK cytotoxicity was higher in the IG vs CG, particularly among those who received ≥5 consecutive days of study intervention compared with control (13.79 vs 10 lytic units, respectively; CI, 11.42-16.23 vs 10.06 CI 7.56-12.56, P = .05). Infants in IG were heavier at end of study and had greater daily weight gain compared to CG (unadjusted daily wt gain in IG was 27 g/d vs 25 g/d in CG); other immunologic parameters, number of infections, and length of stay were not different between the 2 groups. Minor AE in the CG. The Mann-Whitney U tests were performed for unadjusted values and proportional comparisons between the 2 groups were examined by using Fisher exact x2 test. A series of 2-factor analysis of covariance models were used to examine mean differences in NK cell numbers and other continuously scaled variables, controlling for baseline differences in NK cell numbers, birth weight, and gestational age at randomization.	**Paper** Study population from a single center. Patients were randomized based on PMA; it is possible that there could be differences in results if randomization was based on postnatal age rather than on PMA. There was no justification for randomization by Mode of Delivery (MOD), so additional randomization based on MOD was not done. **Reviewer** -Standard care not described -Long recruitment period between August 2005 and January 2009.

3- Ferber et al, 2002 Israel	Multi-arm Parallel design **Hypothesis** Assess the effect of massage therapy by mothers and staff members on weight gain in preterm infants in NICU.	Academic research funds, the social science dean's scholarships at bar-Ilan University	N=57 3 arms 2 intervention groups I1= 21 mothers I2= 17 staff CG= 19 standard care •7% attrition rate •Random Cluster sample	GA 26 to 34 wks, BW >600g or <2200g -Exclusion criteria: genetic anomalies, Cong. Heart malform, GI disturs, and CNS dysf, age < 5 days, medically unstable, receiving medic, parenteral nutrition, **Context**: NICU medical centers in Israel	**Intervention** **-Massage therapy protocol adapted from Field et al (1) (1986) without KS** and massage extended from 5 to **15 min, 3 X daily over 10 days.** •Massage therapy was scheduled between feedings, and began after a specific feeding had been followed by a 20-min waiting period. • Detailed description of protocol provided	• **Mother** applied massage in one Tx group, trained by professional • **Professional female**, non-relative applied massage in second treatment group **For how long** **10 days**	**Outcome measures** Primary outcomes: **1.Weight gain** (gm) at day 11 2.Total wt gain at day 11 Secondary outcome: Caloric intake	- I1 and I2 showed increased in **Wt gain of 26.4 and 28.3g/day respectfully. Wt. increase in the CG was smaller at only 20.5g/day (p= 0.03).** Separate analyses ANOVA was used to compare wt. gain at time 1 and time 2 (days 1–5 and 6–11, respectively) revealed a significant effect only in time 2 (P= 0.04). Post-hoc Duncan test showed that the two IGs were significant different from the CG, but not significant different from each other. Post-hoc analysis using the Wilcoxon–Mann–Whitney U-test revealed a significant difference between I1 and CG (P= 0.03), as well as between I2 and CG (P= 0.006).	**Paper** • Findings may not translate transculturally • Absence of follow up measures of Wt. gain • Conclusions from this study can only be correlated to the period to which the infant was in the hospital **Reviewer** -No allocation concealment -Long recruitment time April 1996 to May 1998 -Blinding of care providers was not clear -Fathers not involved -Standard care not described

4- Ferber et al, 2005 Israel

Multi-arm Parallel design **Hypothesis** To investigate the effect of postnatal infant massage administered by either staff members or mothers compared to controls on mother–infant interactions (MII).	The Social Science Dean's Scholarships and the Research Authority, Bar Ilan University	N=51 2 int groups, I1=19 by mother I2=15 by staff CG=17 Standard care •10.5% attrition rate •Random Cluster sample	GA not specified preterm BW (1539=/-330) -Exclusion criteria: genetic anomalies, Cong. Heart malform, GI disturs, and CNS dysf, age < 5 days, medically unstable, receiving medic, parenteral nutrition, **Context**: NICU medical centres in Israel	**Intervention** **-Massage therapy protocol adapted from Field et al (1) (1986) without KS** and massage extended from 5 to **15 min, 3 X daily, over a period of 10 days** •Massage therapy was scheduled between feedings, and began 20 min after the end of feeding. • Detailed description of protocol provided	• **Mother** applied massage in one Tx group, trained by professional • **Professional female**, non-relative applied massage in second treatment group **For how long** **10 days**	**Outcome measures** •Coding Interactive Behavior Manual CIB. • It includes 42 codes: 21 for parents, 16 for infants, and 5 for dyads, rated on a 5-point scale ranging from 1 = low to 5 = high.	•MANOVA revealed that MII were more optimal in the IGs compared to CG $p = 0.023$. •Univariate analysis showed differences in three interactive composites; mother–infant dyads in the two massage groups showed more dyadic reciprocity $p = 0.013$ and the infants in these groups were more socially involved $p = 0.017$, compared to CG. •Maternal intrusiveness was higher in the CG compared to the two IGs $p = 0.023$. •Duncan's test showed that both IGs were different from CG and no differences were found between infants in I1 and I2	**Paper** •Relatively small sample size. •The generalization of results is limited to middle-class, highly educated mothers and should be examined in other groups. **Reviewer** -Unjustified sample size -No blinding of care providers -ITT was not done -Standard care not described - Diff participants' numbers were reported in Table 1 and Table 2

5- Field et al, 2008 USA

Method pretest-posttest Parallel design RCT **Hypothesis** Massage therapy increased serum insulin-like growth factor-1 (IGF-1) in preterm neonates	NIH Merit award, an NIH grant Senior Research Scientist Awards and a March of Dimes Grant to Tiffany Field and funding from Johnson and Johnson Pediatric Institute to the Touch Research Institute.	N=42 Did not specify the number in each arm IG and CG • CG Standard care • 3 dropouts out of total N=45	• Mean GA 29.5 wks at birth •Mean BW 1236g, •Mean GA at time of study 34.6 weeks. •Low SES • Exclusion criteria: genetic anomalies or Cong heart malformations, CNS dysfunction, HIV positive, maternal history of venereal dx or alcohol/ drug use **Context**: "grower" (step-down) nursery USA	**Intervention** • Same infant massage protocol as used by previous study **Field et. al, (1) (1986)** **15 minutes**, **3 x/ day**, for 5 days •The first tx session occurred approx one hour after the morning feeding, the second about ½ hour after the mid-day feeding, and the third approximately 45-min after the completion of the second tx session. •Sessions beginning on the day of transfer to the intermediate care IC unit, or as soon after as parental consent was obtained.	**Massage by PT** **For how long** **5 consecutive days.**	**Outcome measures** Serum blood samples taken at Day 1 and Day 5 from heelstick draws examined for **serum insulin and serum IGF-1, vagal activity, Mean weight gain in NICU: g/day**	**1) Change in Wt Gain (gms) –.47 for CG and 13.6 for IG; Inc wt gain for IG (p= 0.02);** **2) a greater increase in insulin (p= 0.001);** **3) a greater increase in IGF-1 (p= 0.05)** -Wt gain was found to be signif correlated to increased insulin and IGF-1 in IG. **-Vagal activity significantly increased during the massage therapy (M= 3.85 to M = 4.30, P< 0.001)**. -MANOVA on birth measures suggested that the groups did not differ on demo variables -Correlation analyses suggested significant relations between these growth variables for the massage group but not for the CG as follows: 1) weight gain was related to increased insulin, r=.60, p=.05; and 2) in weight gain was related to increased IGF-1, r= .46, p=.02.	**Paper** None **Reviewer** -No blinding (data collectors and care providers) -Attrition rate not well explained -ITT was not done -No allocation concealment -Standard care not described

6- Fucile et Gisele, 2010 USA

Method
Factorial RCT
Hypotheses
To assess the effect of an oral (O+O), a tactile/kinesthetic (T/K+T/K), and a combined (O+T/K) intervention on preterm infants' weight gain and motor function and to determine whether the combined O+T/K intervention has an additive/synergistic effect on outcomes.

Fonds de la Recherche en Santé du Québec and a Standard Life Dissertation Fellowship to Sandra Fucile

N=75
I1=19
I2=18
I3=18
CG=20
Standard care
-9 drop outs out of the total N=84
-Block stratification

GA (26–29 and 30–32 weeks) was used to ensure that all four groups had equal GA distribution, and also stratification by time (lasting for three months) to make certain each group had equal distribution of attending neonatologists
-Inclusion criteria infants who received tube feedings, monitored infants who were taking BF as a possible covariate; cointerventions (occupational, physical, and/or speech therapy), and number of parental visits throughout the study
Context:
NICU in Texas Children's Hospital, Houston

Intervention
Multisensory stimulation (3 arms)
I1= Oral stimulation,
I2= T/K+T/K intervention involving whole body stimulation,
I3= O+T/K intervention
CG = control group.
Massage as prescribed by **Field et al (1) (1986). Interventions were administered for 15 minutes, twice a day, for 10 days.** All interventions were commenced 48 hours after discontinuation of nasal CPAP before a morning and an afternoon feeding, with at least a three-hour rest interval between the two interventions for a total of 10 days within a 14-day period.

Massage by PT.
For how long
10 days

Outcome measures
-Mean daily weight gain in (g/kg/day), for two periods,
-Time 1=from first to last day of intervention -Time 2=from last day of intervention to hospital discharge
-TIMP Test of Infant Motor Performance is a criterion referenced standardized assessment from 32 weeks PMA to four months corrected age.

-Significant group difference in mean daily wt gain only during the sensorimotor intervention period i.e.Time 1 **(p = 0.014)**
- **I1** mean **wt gain (17.4± 6.1)**
- **I2** mean **wt gain (17.6± 3.8)**
- **I3** mean **wt gain (15.7± 4.6)**
-CG mean **wt gain (12.6± 5.9)**
-*Posthoc* Bonferroni tests: infants in the I1 and I2 groups had significantly higher mean daily wt gains than those in CG period (all tests $p \leq 0.025$).
-*Posthoc* Bonferroni *tests* indicated that infants in I2 (36.7 ± 4.0) or I3 intervention had significantly higher TIMP scores than those in the CG (30.2 ± 8.2) (all tests $p \leq 0.033$).
One-way ANOVA and Fisher's exact test were used to assess the baseline characteristics of infants in the four groups. One-way ANOVA was used to compare the effect of group on mean daily weight gain and TIMP scores. In case of statistical significance, *posthoc* Bonferroni tests were used to assess differences between groups. Fisher's exact test was used to compare the effect of the four interventions on the categories of TIMP motor behaviour.

Paper
-A limitation of this study relates to the administration of the TIMP by the researcher who was not blind to group assignment.
Reviewer
-Attrition rate not well explained
-ITT was not done
-No allocation concealment
-Standard care not described

7- Fucile et al, 2011 USA	**Method** Factorial RCT **Hypotheses** (1) preterm infants who receive oral, T⁄K, or combined (oral+T⁄K) interventions before the introduction of nipple feeding will demonstrate improved oral feeding performance over control infants. (2) preterm infants who receive a combined intervention will demonstrate better oral feeding performance than those who receive oral or a T⁄K intervention alone.	This study was supported by the Fonds de la Recherche en Sante´ du Que´bec and National Institute of Child Health and Human Development grant	N=75 I1=19 I2=18 I3=18 CG=20 Standard care -9 drop outs out of the total N=84 -Block stratification	Stratification by gestational age (26–29 vs 30–32wk) and time (every 3mo) was done to ensure equal gestational age and individual neonatologist distribution between each group. **-Inclusion criteria** AGA, received all feedings by tube, and had no congenital anomalies or chronic medical complications, clinically stable **Context**: nursery at Texas Children's Hospital Houston.	**Intervention** Multisensory stimulation (3 arms), I1= Oral stimulation, I2= T/K+T/K intervention involving whole body stimulation, I3= O+T/K intervention, CG control group. Massage as prescribed by **Field et al (1) (1986).** **Interventions were administered for 15 minutes, twice a day, for 10 days.** The combined intervention involved 15 minutes of oral or T⁄K, as above, each once a day, in random order. All interventions were commenced 48 hours after discontinuation of nasal CPAP The sessions were provided 30 minutes before tube feedings, with a minimum 3-hour interval between each session. The interventions were administered for a total of 10 days within a 14-day period.	**Massage by PT**. **For how long** **10 days**	**Primary outcome**: Time to attainment of independent oral feeding (the number of days from introduction to successful oral feedings⁄ day for 2 consecutive days) **Secondary outcomes:** -proficiency (intake in the first 5min, %), -volume transfer (%), -rate of transfer (mL⁄min), -volume loss (%) -length of hospital stay (d).	**Infants in the three intervention groups achieved independent oral feeding 9–10 days earlier than those in the control group (p<0.001). Proficiency (p<0.002) at the time of one to two and three to five oral feedings per day, volume transfer (p<0.001) at one to two, three to five, and six to eight oral feedings per day, and overall rate of transfer (p<0.018) were greater, and overall volume losses were less (p<0.007), than in CG (p<0.042).** **-A**t three to five oral feedings a day only I1 group demonstrated marginally greater volume transfer than CG (p=0.07). -I3 attained independent oral feeding at a significantly younger postmenstrual age than CG (p=0.020) and had clinically greater proficiency than I2 (p=0.020) and I1 (p=0.109). -A two-way analysis of variance and RANOVA, with GA and group as factors and sex, nb of breast-fed infants, and parental visits as covariates, were used to compare the effect of the interventions on the primary and secondary outcomes respectively. Post-hoc Tukey tests were applied for all significant group, time, or group by time significant effects.	**Paper** -Lack of a specific protocol for discharge planning in the study. - The advancement of oral feeding, which was left to the attending neonatologist's discretion. **Reviewer** -Attrition rate not well explained -ITT was not done -No allocation concealment Standard care not described

Method Parallel RCT **Hypotheses** (1) to monitor weight gain among preterm infants with and without a massage program; (2) to assess if observed differences in weight gain impacted hospital stay; (3) to assess secondary effects, if any, among neonates receiving massage.	Not mentioned	N=60 I=30 C=30 Standard care -8 drop outs out of the total N=68	• GA 30-35 weeks, Clinically stable, in incubator • Exclusion criteria: Cong anomalies Inadequate feeders, infants receiving other sensory Stimulation protocols **Context**: NICU at Gynecology and Pediatric Hospital in Leon, Mexico	**Intervention** I = Vimala massage C = standard care **Vimala massage (2) protocol 15-20 minutes, 2 times per day** for 10 days • Standard nursing care described as follows: -Daily bathing and orogastric feeding. -Vital signs were recorded every 4 hours. -Diaper changes by nursery personnel occurred every 4 hours, or when necessary including change in clothing. -Human contact was provided an average of 15 times in 24 hours, including nursery personnel and parents. Mothers had four set visit times (9:00, 12:00, 15:00, and 18:00 hours) staying on average for one hour to participate in feeding and changing diapers for their children; fathers were allowed two visits per day (morning and afternoon).	**• Vimala massage administered by parents, trained by one researcher** **For how long** **10 days**	**Primary Outcome** • **Weight gain** as measured in gm by digital scale •Infants weighed 1hour prior to scheduled feeding **Secondary Outcome** -LOS in days -Reports of significant side effects of massage	-RANOVA revealed that the Vimala massage group gained significantly more weight over the 10 days. **The daily wt gain averaged 29.2±5.3 g for the massage group and 20.9±7.6 g for the CG (p<0.001).** -IG wt gain > CG since day 3 (p=0.02) and was sustained throughout the remainder of the study. -By day 10 of the study, newborns receiving massage and usual nursery care had gained a mean of 188.2±41.20 g/kg for the massage group compared with 146.7±56.43 g/kg for the control group (p<0.001). -IG hospital stay was shorter than usual nursery care **(15.63±5.41 days versus 19.33±7.92 days, p=0.03).** -IG had decreased LOS at approx 15 days as compared to approx 19 days for CG. -t test and $\chi 2$ test were used to compare the two groups at baseline. -Repeated measures RANOVA was used to assess caloric intake and weight gain, followed by individual α-corrected Bonferroni univariate statistics. -There have been no reports of significant side effects of massage.	**Paper** • Study included only medically stable infants • Medications affecting nutrient absorption were not recorded. **Reviewer** • Did not follow outcomes for infants beyond 35 weeks • Did not follow developmental outcomes other than wt gain and LOS • Unjustified sample size Standard care described

8- Gonzalez et al, 2009 Mexico

Method pretest-posttest Parallel design RCT **Hypothesis** Infant massage determines changes in EEG spectral activity, a highly sensitive index of brain maturation	Ministero dell'Istruzione, dell'Universita`,e della Ricerca (Progetti di Rilevante Interesse Nazionale) and by Fondazione Mariani	N=20 I=10 C=10 Standard care	GA between 30 and 33 weeks **-Inclusion criteria** (1) birthweight between the 25th and 75th centile, (2) birth length greater than the 10th centile, and (3) no rminor abnormalities on brain ultrasound **Context**: the Neonatal Unit of the University Hospital of Pisa, Italy	**Intervention** Massage therapy by F**ield et al (1986) (1)** T/K was started on postnatal day 10 (±1). Sessions were performed **3x/ day** for two blocks of 5 days each, separated by a 2-day interval **60 minutes before feeding** at least 2 hours after the completion of the previous stimulation.	**Massage by PT** **For how long** **10 days** during a 2-week period.	**Outcome measures** Global parameters of electroencephalography (EEG) activity, a highly sensitive index of brain maturation. EEG was performed at around 1 and 4 weeks, i.e. T0=pre-massage at one week of age (±1d) T1=post-massage at around 4 wks of age (±2d)	-Within-group differences were analyzed by a paired sample t-test, unadjusted. The variation of global EEG power between T0 and T1 was significantly different between the two groups for the slow 0.5 to 4 Hz frequencies, owing to a reduction of delta power in comparison infants relative to massaged infants. -Between-group differences were analyzed by a two-way analysis of variance for repeated measures with time (pre- vs post-massage) and participant groups as factors. Levine's test was used to assess equality of variances. **The interaction between time and participant group was significant for the global spectral power in the delta band (p=0.046), for the local spectral power from the central leads in the delta band (p=0.001), and in the beta band (p=0.044).** This was due to the significant decrease of EEG spectral power in non-massaged infants relative to massaged infants between T0 and T1.	**Paper** -Small sample size. - In most of the analyses the group variance was low. -The limited number of electrodes used did not allow a high spatial discrimination and therefore a good localization of the activities that were different between the two groups. -It did not correlate EEG findings with any measure of development. **Reviewer** -Unjustified sample size -Baseline characteristics for CG and IG not statistically equal -No blinding of care providers -Long recruitment period (November 2005 to August 2007) -Standard care not described

9- Guzetta et al, 2011 Italy

Method pretest-posttest Parallel RCT **Hypothesis** Preterm neonates weighing <1800 g show better weight gain after 4 wk of massage with oil compared to standard care of low birth weight baby without massage.	None	N=48 I= 25 C=23 Standard care -4 drop outs out of the total N=52	-BW <1800 g, gestation<35 wk and<48 h of age at enrolment -Inclusion criteria: Infants were on at least 100ml/kg/d of feed (oral or tube feed). No IV line. **Context**: NICU of LLRM Medical College, Meerut, U.P.	**Intervention** **-Massage therapy protocol adapted from Field et al (1) (1986) without KS** and for **10 min**, **4 times per day for 4 weeks** with 2.5 ml/kg of sunflower oil per massage**.** Initial massages performed by the mothers were supervised and mother's compliance was checked regularly by the researchers. -If babies were discharged from the hospital before completing the trial, mothers were given measured amounts of oil so as to last till their next visit.	• **Mother** applied massage trained by professional **For how long** **4 weeks**	**Primary outcome** variable was difference in weight gain 28 d after enrolment into the study. **Secondary outcomes** -difference in length and head circumference 28 d after enrolment, -loss of weight 7 d after enrolment -difference in serum triglyceride levels 28 d after enrolment	-Group means of continuous normally distributed data were compared using unpaired t-test. Categorical variables were compared with chi square test. -Mean (SD) weight gain of babies in the two groups was 1466.4±226.8 g in oil massage group and 1416.6±229.9 g in the CG. -At 28 d, Wt gain in the oil massage group (476.76±47.9 g) was higher compared to the CG (334.96±46.4 g) (p<0.05). -At 7 d, less wt loss (7.80±9.8 g) was observed in oil massage group compared to CG (21.52±19.4 g) (p00.003). -There was no significant difference in serum triglycerides and other anthropometric parameters.	**Paper** 1. Lack of blinding of intervention. 2. Longer duration of follow up is required to assess the long term effect of oil massage on overall anthropometry and neurodevelopmental outcome of preterm babies. **Reviewer** - ITT was unclear Standard care not described

10- Kumar et al, 2012 India

Method pretest-posttest Parallel RCT **Hypotheses** 1. Massage would decrease body fat deposition in preterm infants. 2. We also tested the relationships between massage, body fat deposition, and circulating leptin and adiponectin in preterm infants.	The National Institutes of Health and University of Utah Interdisciplinary Research.	N=44 IG=22 12 girls, 10 boys CG=22 Standard care -18 drop outs out of the total N=62	Infants born between 28 4/7 and 32 3/7 weeks' PMA confirmed by maternal dates mid-pregnancy and dimensional fetal ultrasound, and physical examination at birth and with birth weight, length, and head circumference between the 10th and 90th percentiles for GA were eligible for study. Inclusion criteria: Infants tolerating enteral feeding volumes >100 mL/ kg/d. **Context**: NICU at University of Utah Hospital or Intermountain medical Center	**Intervention** **Massage** adapted from (**Vimala Mclure, 2000**) **(2)** -The massage and control treatments were performed for 20 minutes twice daily at 7:00 a.m. and 7:00 p.m., 6 d/wk (Monday through Saturday) for Duration: **maximum of 4 weeks.** -The massage and control treatments were performed behind privacy screen by a licensed massage therapist. -The massage treatment was modeled after the Infant Massage USA (Springfield, Virginia) protocol and modified for preterm infants by eliminating massage of the abdomen.	Massage by PT **For how long** **4 weeks**	**Outcome measures** Primary outcomes: 1.weight gain at the end of the study 2. Mean wt gain: g/kg/day 3. Length, body circumference, skin fold thichness and ponderal Index Secondary outcomes: 1. Enteral feeding volume 2. body fat deposition 3. circulating IGF-1, leptin and adiponectin levels in preterm infants	-Correlation Differences between massage and control infants' characteristics at birth and study entry we measured and reported. -The generalized estimating equation (GEE) procedure was used to determine the effect of treatment (massage or control) on anthropometric measures, growth rate, and serum measures for all infants. - No difference in weight gain, IGF-1 and leptin. - The overall average daily wt gain was 16.8 ± 4.8 g/kg/d (massage) compared with 16.4 ±5.5 g/kg/d (control). Male infants in the massage group had smaller Ponderal Index (PI), triceps skinfold thickness, mid-thigh skinfold thickness, and subscapular [SSF]) and increases over time compared with control male infants ($P < .05$). Female infants in the massage group had larger SSF increases than control female infants ($P < .05$). -Pearson r controlling for time was used to test the relationships between measures of growth and serum biomarkers. - Circulating adiponectin increased over time in CG male infants (group x time x sex interaction in comparaison to IG where it remains stable, $P < .01$) and was correlated to PI ($r = 0.39$, $P < .01$).	**Paper** 1. Data collection was limited to 44 preterm infants born at 29-32 weeks' gestation. 2. Small sample size was offset by: (1) restricting eligibility to medically stable, preterm infants to ensure a more homogeneous cohort in regard to growth and body composition; and (2) using a prospective, longitudinal study design to increase statistical power. **Reviewer** -Small sample size -No allocation concealment -ITT was not done -Standard care not described

11- Moyer-Mileur et al, 2012 USA

Multi-arm Parallel design RCT **Hypothesis** The effect of massage with coconut oil on wt gain in preterm newborns	Mashhad University of medical sciences	N=73 I1=25 massage with coconut oil I2=23 massage only C=25 no intervention -2 drop outs out of the total N=75	GA 27-37 weeks -Inclusion criteria: Medically stable with no requirement of drug, ventilation or parental nutrition and without cong anomalies and skin cond. **Context**: NICU at Mashhad University of medical sciences	**Intervention** **Only TS as per the procedure described by Mathai *et al* (2001) (4).** Intervention started at 2-10 days of life. I1 massage with 4ml of oil during 5 min four times/day for 7 days in prone and supine position I2 same as I1 without oil CG=no massage intervention	**Massage by trained person** **For how long 7 days**	**Outcome measures** • Weight gain as measured in gm.by digital scale	The groups were compared for equivalency on demographic indicators, using one-way ANOVA. The differences in the mean of weight (between the first and the end of study's period) for the three groups were separately analyzed by the paired t-test. ANOVA and Tukey tests were used to determine whether there was any difference in gaining weight between groups. **-I1wt gain (212.40±240.28 g) compared to I2 (7.39±96.68g) and CG (28±224.4 g) (p<0.001)** Difference between I1 and I2 and C was significant (p=0.002 and p= 0.005), but there was not a significant difference between groups I2 and C (p>0.050).	**Paper** Results cannot be generalized to full term, high risk and very low birth weight neonates. Separate analysis of infants with appropriate and retarded intra uterine growth could not be done because of inadequate sample size. It was better that, we could control study by a placebo group. **Reviewer** -Blinding of care providers was not done -ITT was not done -Unclear description of the massage intervention -Standard care not described

12- Saeedi et al, 2011 Iran

13- Sankaranarayanan et al, 2005 India

Open Label randomised complete block Design **Hypothesis** The effect of massage with coconut oil versus mineral oil and placebo (powder) on growth velocity and neurobehavior in well term and preterm babies.	Marico Industries Ltd. provided the oils and placebo for the study.	N=112 I1=38 coconut oil massage I2=37 mineral oil massage Placebo= 37 Massage with baby powder - 32 infants completed the follow up in I1 and I2 and 31 in the placebo group -Block randomization	-Infants weighing 1500-2000g AGA, -Inclusion criteria: medically stable -Apgar Score >7 at 1 and 5 minutes -On breastfeed or expressed breast milk - Adequate family support. **Context**: Intramural neonates at major tertiary care center	**Intervention** • Massage and stimulation were as per the **procedure described by Mathai *et al* (2001) (4).** Session duration is 5 min, 4 times per day with coconut or mineral oil by trained person one hour after a feed. Or massage with baby powder same as above	**Massage by trained person** from day 2 of life till discharge and after by mother (who was trained) till day 31 **For how long Day 2 of life till 31**	**Primary Outcome** Weight gain velocity in gm over the first 31 days of life **Secondary outcomes** 1.Length gain velocity in cm 2.Head growth 3.Brazelton Neonatal Behavioral Assessment Scale (BNBAS) 4. Incidence of adverse events.	-The groups were compared on each parameter using‘t’ test (2-tailed unpaired) for parametric data and chi square test for nonparametric data. Total weight gain, weight gain velocity, and length gain velocity was found to be significantly higher in the coconut group as compared to the mineral oil and placebo group as follows respectively: **Weight gain velocity (g/kg/day) 10.99 ± 2.57; 9.02 ± 2.13; 8.45± 2.75 (P<0.05)** **Length gain velocity (cm/week) 0.63 ± 0.12; 0.59 ± 0.16; 0.56 ± 0.16** - BNBAS outcome was similar in the three groups -The study reports adverse events in 6 preterm babies, 2 in each group, of a mild rash which did not require discontinuation of application.	**Paper** None **Reviewer** -No blinding (data collectors and care providers) -ITT not done -Unclear description of the massage intervention -unclear description of adequate family support - Excluded parents who lived far from hospital - unclear the qualification of the trained person who performed the massage -Not clear the standard care

Method Masked (blinded) Parallel design RCT **Hypothesis** Massage would improve ANS development and function in preterm infants as demonstrated by increased HRV. HRV measured before, during and after massage as an indicator of ANS development and function.	National Institutes of Health University of Utah Interdisciplinary Research Committee, College of Nursing Research Committee, and division of Neonatology Development Fund.	N=37 I=17 C=20 Standard care -15 drop outs out of the total N=52	-GA 29 to 32 week preterm infants. -Inclusion criteria: Birth post-menstrual age 28 4/7 to 32 3/7 weeks, AGA, enteral feeding of 100ml/ kg per day no later than day 14 of life. Medically stable. **Context**: University of Utah Hospital and Intermountain Medical Center NICUs, Salt Lake City, UT.	**Intervention** **Massage** adapted from (**Vimala Mclure, 2000**) **(2).** The protocol was modeled after the Infant Massage USA protocol (**T/K**) and modified for preterm infants by eliminating massage of the abdomen. [1] -Massage was performed for 20 min 2x/day from study days 1 to 29. - None of the infants developed physiological instability during the massage or control periods.	Licensed **massage therapists** provided the massage or control condition **For how long 4 weeks**	**Outcome measures** -HRV for 40 minutes - LF/HF ratio at 4 weeks -Increased **HRV** is demonstrated when a decrease in LF/HF ratio occurs and is indicative of increased parasympathetic activity -Decreased HRV is demonstrated when the LF/HF ratio increases and is indicative of increased sympathetic activity.	**-HRV improved in IG but not in the CG (p<0.05).** **-LF/HF ratio of IG was lower (mean 6.34±0.04) than that of CG (mean 8.04±0.06).** -Massaged males had a greater improvement in HRV than females (p<0.05). -The mean increase in LF/HF ratio in control infants was +2.77 and the mean decrease in LF/HF ratio in massage infants was –2.14. -Sex was included as a covariate in the LF/HF ratio analysis. Both two-way (groupxtime) and three-way (groupxtimexsex) effects on LF/HF ratio pre-session, during the massage or control session, and post-session were examined-Control males had significantly higher LF/HF ratio at weeks 3 and 4 (p=0.004) compared with week 0 and compared with massage males at weeks 3 and 4. - Post-hoc analysis evaluating the effect of NICU, sex and caffeine citrate medication revealed only a significant effect by sex of the infant on the LF/HF ratio P<0.05).	**Paper** Lack of standardized ranges for LF and HF regions of HRV for infants. Other measures of ANS function were not used in this study. **Reviewer** -Medication given were not assessed - Researcher not blinded -Unknown long term effects -Standard care not described

14- Smith et al, 2013 USA

[1] The massage protocol consisted of the application of six soft-tissue compression strokes to the following areas of the supine infant: (1) top of thighs to ankles and feet, (2) chest over ribcage, (3) shoulders down the arms to hands, (4) head from crown to neck and (5) along the back from the neck to the waist. Range of motion to the arms and legs was delivered following the massage.

15- Teti et al, 2009 USA

Method
Parallel RCT
Hypothesis
The efficacy of an early intervention program targeting African American mothers and their premature, LBW infants at 3 to 4 months' corrected age

the National Institute of Child Health and Human Development awarded to the first author

N=138
I=66
C=72
Standard care
-35 drop outs out of the total N=173

-GA<37 weeks (Mean=30.12, SD 3.45)
African American premature, low birth weight infants and their mothers
-Exclusion: mothers with positive toxicology screen, were less than 18 years of age, or if infants had a chromosomal abnormality.
Context:
Four NICUs of the University of Maryland Medical System and Mercy Medical Center, and Washington Hospital Center and Children's National Medical Center

Intervention
Two psycho-educational components and one parent-administered infant **tactile and kinesthetic stimulation** component **(Field et al, 86)** **(1)** into a home transportable package
Intervention began at 32 weeks' post-conceptual age (PCA) for infants born at <32 weeks' GA, and between 32 and 36 weeks' PCA for infants born after 32 weeks' GA. Intervention onset co-occurred with medical stability. Each family was assigned one interventionist during the 20-week intervention period. Intervention sessions lasted 1 to 2 hr. Massage demonstrations with parental involvement were given again at 38 to 42, 40 to 44, 44 to 48, 48 to 52, and 52 to 56 weeks' PCA, and followed each time by NBAS administration. Parents were encouraged to engage in ten 15-min massage sessions with their babies 2 to 3 times a day and to keep a daily record of how often they massaged their babies.

Massage by interventionist and parents
For how long 20 weeks from the NICU to the home

Outcome measures
1.maternal self-efficacy
2.Bayley Mental Development Index (MDI) scores

One-way analyses of variance and chi-square analyses indicated that the intervention and control groups were comparable at baseline on all medical and sociodemographic indices.
Intervention mothers had reliably **higher maternal self-efficacy scores (*M* =36.41, *SD* =2.63) than did control mothers (*M* =35.21, *SD* =2.95).**
-Pearson and point-biserial correlations revealed no significant association between infant birth weight and maternal education, Pearson *r* (136) = –.03 and between infant BW and poverty status, *r* (127) = .17. There was, however, a significant correlation between maternal education and poverty status, point biserial *r* (127) = –.50, *p* < .001
-ELBW intervention infants had a mean MDI score that was almost 10 points higher than that of ELBW controls but no intervention effects are observed among LBW infants
-One-way analysis of variance revealed that infants in families living in poverty were massaged less frequently (*M* = 46.19, *SD* = 35.91, range = 3 to 138) than were infants in families living above poverty thresholds (*M* = 78.49, *SD* = 40.63, range = 8 to 184), *p* = .001.
-No intervention effects were found for infants of families living in poverty.
-No associations were obtained between frequency of massage and either birth weight group or maternal education.

Paper
-The 3 components of the intervention comprised an integrated package
-Different components may be more or less effective for different subgroups of infants and families.
-Subgroups of differing sample sizes were formed during analyses of intervention moderators.
-It is difficult to determine whether this had any impact on the ability to detect effects.
-The current findings are limited to predominantly low-income African American premature, LBW infants and their mothers.
Reviewer
-Blinding of care providers was not done
-Unclear description of the massage intervention
-long recruitment period (Feb 2002 and Dec 2004)
-Unclear analysis
-No transparent reporting
-No consort statement
-Standard care not described

Method Multi-arm Parallel design RCT **Hypothesis** Neurodevelopment and biological benefits of the simultaneous use of multimodal stimulation (SMS) and the cutaneous application of vegetable oil.	National Institute of Health and Medical Research and by the department of child psychiatry of Necker-Enfants Malades Hospital, Necker Institute Research Fund, Paris through a grant from Lesieur society, vegetable oil provided by them.	N=49 I1=12 I2=12 I3=12 C=13 Standard care -11 drop outs out of the total N=60	GA 31-34 wks Inclusion criteria: no O2 requirement, no congenital or genetic abnormalities, no CNS disturbances or maternal drug addiction **Context**: NICU in Tertiary referral center serving the Poitou-Charentes region of France.	**Intervention** **3 treatment groups**, Sensori-tonico-tactile, vestibular, proprioceptive, kinesthetic, auditory, visual, olfactory. **Sensori-Tonico-Motor (STM) touch for 10 days with either:** **I1= sweet almond oil, I2=ISIO4 blended oil, or I3=placebo – normal saline** **CG** who did not receive any intervention **Moderate pressure massage as described by Vaivre-Douret 1997, 2003 (3) protocol** was performed for **15 min, 2x/day** during the periods of wakefulness at different moments from tube feeding or BF (morning and afternoon at 10:30 am, and 3:00 pm)	**Massage by PT** **For how long 10 days** (from days 5 or 6 through days 15 or 16)	**Primary Outcome** 1.Weight gain in gm. **Secondary Outcomes** 2-linear growth, neurological maturation, psychomotor development 3- number of days of admission	-Continuous data conforming to a normal distribution were compared using Student's *t*-test and analysis of variance as appropriate. The categorical data were compared by calculating the chi-square value or by Fischer's exact test. The data not conforming to a normal distribution were compared using the Mann–Whitney test, the Kruskall-Wallis, and the Wilcoxon signed rank test as needed. **-I2 demonstrated enhanced weight gain (+57%,95% CI 37–76) compared with CG (p = 0.03).** -All STM groups showed **shorter admission times (mean reduction 15 days, (*P* = 0.005),** and **an increase in body length (*P* = 0.03).**	**Paper** -Infants in the CG had similar gestations but lower mean weight, length and head circumferences at birth. They were more growth restricted for their GA compared with the IGs -The parents of the CG visited much less than those of the intervention groups which could have affected the weight gain, neuropsychological scores and the behavior (amount of quiet wakefulness) of the infants. **Reviewer** -Did not specify routine/standard care -Birth weight differed between control and experimental groups and was not adjusted in the analysis -diverse interventions in addition to massage

16- Vaivre-Douret et al, 2008 France

MASSAGE THERAPY is defined by The American Massage Therapy Association (2008) as a profession in which the practitioner applies manual techniques, and may apply adjunctive therapies, with the intention of positively affecting the health and well-being of the client.
MASSAGE is manual soft tissue manipulation, and includes holding, causing movement, and/or applying pressure to the body. **MANUAL** means by use of hand or body.
THERAPY is a series of actions aimed at achieving or increasing health and wellness.

Appendix 17: Summary of Studies Intended for the Meta-analysis

Study/ year/ Country/ Funding	Method		Sample Size			Mean age GA	Inclusion criteria	Massage Intervention MOA		Intervention by whom and days of Massage			Outcomes	*Results*						NB Lost to Follow
	Design	N	E1	E2	C			T	T/K	Mother (M) / Oil (O)	Staff (S) / No oil (NO)	days	1. Primary 2. Secondary	M E1	SD	M E2	SD	M C	SD	
1.Aly et al, 2004 Egypt	Pretest-posttest RCT	30	15		15	28-35	<2weeks old Stable On NG tube feeding		15 min 1x/day Field		E=S	NR Until 1.8kg	Serum PICP For bone formation	from 62.5 to 73.84	from ±13.8 to ±12.9			from 82.3 to 68.78	from ±8.5 to ±14.6	ITT done
2. Ang et al, 2012 USA	Block RCT	120	58		62	28 – 33	Stable No breastmilk		15 min 3x/day Field		E=S	5d/w for max. 4 wks or until discharge	1. NK cells 2. NK Cytotoxicity -Mean Daily wt gain g -LOS d -Nb of infections end of study	27 g/d 8(13.7%)	7.0 P 0.56			25 g/d 6(10.3 %)	6.0 P 0.56	ITT done
Badiee et al, 2011 Iran	Parallel RCT	60	20	20	20	28-34	>7 days old Stable On NG tube No IV	5 min 3x/day Field		E1= M	E2= S	5	1.Mean wt gain 5th compared to 4th day -LOS -Fluid intake	4.6	1.0	6.5	2.5	3.7	1.5	5
Cheung and Song, 2009 Korea	Pretest-posttest RCT	56	28		28	29-34	Stable On NG tube or oral feeding No IV	15 min 1x/day Field			E2= S	7	Wt diff (g) HC cm Length cm Cortisol µg/ml	220.35 1.51 1.82 -0.7	80.20 0.88 1.26 6.03			197.50 1.25 1.35 0.96	73.21 0.93 1.60 7.48	4

3.Ferber et al, 2002 Israel	Cluster RCT	57	21	17	19	26-34	>5days old Stable	15 min 3x/day Field		E1= M	E2= S	10	Mean wt gain over 10 days	291.33	95.54	311.35	86.48	225.52	109.74	7%
3.Ferber et al, 2002 Israel	Cluster RCT	57	21	17	19	26-34	>5days old Stable	15 min 3x/day Field		E1= M	E2= S	10	Mean daily wt gain during the study period	26.4 g/d		28.3 g/d		20.5 g/d	3.87	7%
4. Ferber et al, 2005 Israel	Cluster RCT	51	19	15	17	NR Wt 1539±330	>5days old Stable	15 min 3x/day Field		E1= M	E2= S	10	MII Dyadic reciprocity Child social involvement	2.42 4.15	± 0.87 ±0.53	2.46 4.29	± 0.99 ±0.64	1.66 3.52	± 0.68 ±1.08	10.5 %
Ferreira and Bergamasco, 2010 Brazil	Pretest-posttest quasi-experiment	32	16		16	31-35 BW<2 500g	Stable In Interm Care Nursery		5-15 min 1x/day Field?		E= S	?	-M daily Wt Gain g -LOS d	6.08 13.44	13.33 8.57			4.53 18.19	26.66 13.8	
5. Field et al, 2008 USA	Pretest-posttest RCT	42	NR		NR	M=29.5± 2.6 wks gestation M BW= 1237 g ±317.85	Stable In Interm Care Nursery		15 min 3x/day Field		E= S	5	-Change in Wt Gain g -Change in insulin (µU/mL) - Change in IGF-1 (ng/mL)	13.6 0.95 0.72	16 0.24 0.74			−0.47 0.42 0.33	24.1 0.11 0.49	3
Freitas et al, 2010	Pretest-posttest Quasi - experiment	32	16		16	26-32	Stable with NG tube		15 min 3x/day Field 45min after feeding No talking		E= S	5	-M Wt Gain g after massage -Groupxtime total wt increase g	35.98 2878	P=0.048			24.81 1985	P=0.048	5
6. Fucile & Gisele, 2010	Factorial block RCT	38	18		20	26-32	48 hr after CPAP was D/C Stable with NG tube		15 min 2x/day Field		E= S	10	-Mean daily wt gain -Motor function	17.6 36.7	3.8 ± 4.0			12.6 30.2	5.9 ± 8.2	9

7. Fucile et al, 2011 USA	Factorial block RCT	38	18		20	26-32	48 hr after CPAP was D/C Stable with NG tube		15 min 2x/day Field		E= S	10	1-Number of days of independent oral feeding 2-LOS in d	11.4 55.7	0.8 3.7			20.7 55.3	1.5 2.6	9
Golchin et al, 2010 Iran	Pretest-posttest RCT Double blinded	54	27		27	BW<2500g	Age<18day BF		15 min 3x/day Field 45min after feeding		E= S	10	Mean wt gain g	210.92	103.3			81.11	166.1	
8.Gonzalez et al, 2009 Mexico	Parallel RCT	60	30		30	30-35	Stable with NG tube Standard care well explained		15 min 2x/day Vimala	E= M		10	1-Mean daily wt gain 2. -LOS in days -Secondary effects	29.2 15.63 None	5.3 5.41			20.9 19.33 None	7.6 7.92	8
Guzzetta et al, 2009 Italy	Matched Pretest-posttest Quasi-Experiment	20	10		10	30-33 First assessment, 7–9 d after birth (T1); second assessment, 3 wks later (T2)	Massage started at day 10 Stable BW between 25th and 75th centile Standard care well explained		15 min 3x/day Field		E= S	10	1.Maturation of EEG activity by median reduction 2. Median IGF-1 in blood at T2 in ng/ml 3.Wt gain between T1 and T2 in g 4. Amount of cortisol reduction median and inter-quartiles	7 s interquartile (IQ = 5.3–9) 81 561 -0.8	IQ=[74, 93] 83.5 -.81, -0.48			2.8 s (IQ= 2–3.8) 33 535 -0.178	IQ=[28, 41] 83 -.526, -0.13	
9.Guzzetta et al, 2011 Italy	Pretest-posttest RCT	20	10		10	30-33 Pre-massage (T0) and post-massage (T1)	Massage started at day 10 Stable BW between 25th		15 min 3x/day Field		E= S	10	EEG changes -delta band activity -Spectral power from the central leads in the	F1,15=4.7 F1,15=15.8	p=0.046 p=0.001			Reduction of delta power	significant decrease of EEG spectral	

						EEG	and 75th centile						delta band - beta band	F1,15=4.8	p=0.044				power between T0 and T1	
Hosseinzadeh et al, 2012	Quasi experiment	48	25		23	LBW	Massage started at day 3 after birth Stable		15 min 1x/day At home	E= M With sesame oil		4 wks	Wt gain Increase in height	217 g more 0.7cm more	P<0.001 P<0.002					
10.Kumar et al, 2012 India	Pretest-posttest parallel RCT	52	25		23	BW<1800g GA<35 wks	Enrolled <48h of age Feeding at least 100ml/kg/d No IV line	10 min 4x/day Field		E= M With sunflower oil		28	Over 28 d 1.Mean Wt gain in g 2. -Length cm -HC cm -Loss of wt 7d after enrollment g -diff in serum triglycerides (mg/dl)	476.7 43.6 31.9 7.80 108.6	47.9 2.9 1.7 9.8 23.1			334.9 43.9 31.3 21.52 101.7	46.4 2.9 1.5 19.4 41.7	4
Lee, 2005	Pretest-posttest Parallel RCT	26	13		13	BW<2000g GA<36 wks	Enrolled second day after starting enteral feeding Stable		15 min 2x/day Field		E= S	10	-M Wt gain at end of 10 d in g -Physiologic -Behavioral	1829.2	259.9			1732.3	220.5	
11.Moyer-Mileur et al, 2012 USA	Pretest-posttest Parallel RCT	62	22		22	28 4/7 to 32 3/7 wks PMA 10th to 90th centile	Feeding > 100ml/kg/d		20 min 2x/day Vimala		E= S	Max 4wks (6d/wk)	- Mean daily wt gain g -Δ/wk for: -PI kg/cm3 -Length cm -HC cm -leptin ng/ml Adiponectin pg/ml -IGF-1ng/ml	16.8	4.8			16.4	5.5	18
Saeedi et al, 2009	Pretest-posttest	121	40	40	41	28-34	< 28 days	5 min with			E1=S With	7	Mean daily wt gain on day 7	105.0	1.3	52.0	0.1	54.0	1.3	5

Iran	Parallel RCT						Stable NG tube No IV	oil 4x/day Mathai			oil E2=S Without oil								
12.Saeedi et al, 2011 Iran	Multi arm parallel RCT	75	25	23	25	27-37	Massage started at day 2-10 of life Stable	5 min with oil 4x/day Mathai			E1=S With coconut oil E2=S Without oil	7	Mean daily wt gain on day 7	212.4	240.28	7.39	96.68	28.0	224.4	2
14. Smith et al, 2012 USA	RCT												-Heart rate variability -Length cm -HC cm							
15.Teti et al, 2009 USA	RCT												-Maternal self-efficacy -MDI							

NR=Not reported; GA=Gestational age; E= Experimental group; C=Control group/standard care/no intervention; T=Tactile stimulation, T/K= Tactile and kinesthetic stimulation

Appendix 18: Introductory letter to indicate interest in participation and socio-demographic background information about participants (Mothers)

School of Nursing and Midwifery

Exploring the cultural, contextual and organisational processes that might affect the implementation of massage in the Lebanese Neonatal Intensive Care Unit (NICU) environment

Introductory letter to indicate interest in participation in a research study

You are being invited to take part in a research project that aims at exploring the cultural and contextual processes within a Lebanese Neonatal Care Unit (NICU) environment that could act as facilitators and barriers for future implementation of infant massage in NICU. This study is important and your involvement could help many people. This research is part of a PhD study being undertaken by Bahia Abdallah at the University of Dundee, Scotland, UK. The core research team comprises: Bahia Abdallah (Principal Investigator) (PhD student at the University of Dundee), Professor Martyn Jones (University of Dundee), Dr Heather Whitford (University of Dundee), and Dr Caroline Bradbury-Jones (University of Manchester).

If you agree to be approached to learn more about the study entail and your degree of involvement, please fill the attached tear-off slip and hand it back to the to the NICU ward within 24 hours.

For further information about this research study, you can contact:

Researcher: Bahia Abdallah, RN, MPH, IBCLC is the Principal Investigator and will be pleased to answer any questions you may have about this study.

Tel: 01-562108 ext: 110 Fax: 01-562110 Email: bahia.abdallah@balamand.edu.lb

Or you can contact the Supervisory team:

Primary Supervisor Professor Martyn Jones E-mail: m.c.jones@dundee.ac.uk

Dr Heather Whitford E-mail: h.m.whitford@dundee.ac.uk

Dr Caroline Bradbury-Jones E-mail: caroline.bradbury-jones@manchester.ac.uk

Thank you for taking time to read this introductory letter and for considering taking part in the study.

Tear off slip ----------

Personal Profile

Nationality:

Age:

Your infant age in weeks: **Your infant weight in grams**:

Occupation: **Place of living** (rural or urban):

Educational level (Highest level of school or education you have completed) Primary Complem Secondary University

I agree to be contacted to learn more about this research: YES NO

_____ _____

Name and Signature Date

Contact details

_____

Introduction and Tear off slip for Mothers - Arabic version

الملحق (الإستمارة): أ (الجزء الأوّل)

إستكشاف العمليّات الثقافيّة، التنظيميّة والسياقية التي يمكن أن تؤثّر على ممارسة التدليك في محيط مركز العناية الفائقة للخدج (NICU) اللبنانيّة.

رسالة تمهيديّة تبيّن الفائدة من المشاركة والمعلومات الخلفيّة السوسيو- ديموغرافيّة عن المشاركات (الأمّهات).

أنت مدعوّة للمشاركة في مشروع بحثي يهدف إلى استكشاف قضايا ثقافيّة وسياقية داخل محيط الNICU اللبنانيّة التي يمكن أن تعمل كميسّرات ومعوّقات لممارسة مستقبليّة لتدليك الأطفال في الNICU. هذه الدراسة مهمّة ومشاركتك بها يمكن أن تساعد العديد من الناس. هذا البحث هو جزء من دراسة دكتوراه لبهيّة عبدالله في جامعة داندي, اسكتلندا, بريطانيا العظمى. يتضمّن فريق البحث: بهيّة عبدالله (المحقّقة الرئيسيّة) (تلميذة دكتوراه في جامعة داندي), البروفسور مارتن جونز (جامعة داندي), الدكتورة هثير وتفورد (جامعة داندي), والدكتورة كارولين برادبوري-جونز (جامعة مانشستر).

إذا وافقت الإقتراب (المشاركة) كي تتعلّمي أكثر عن الدراسة المستلزمة ودرجة مشاركتك، الرجاء تعبئة (ملأ) الورقة (القصاصة) المربوطة (الملحقة) القابلة للتمزّق وتسليمها إلى جناح الNICU خلال 24 ساعة.

للمزيد من المعلومات عن هذه الدراسة البحثيّة, يمكنك الإتصال:

الباحثة: بهيّة عبدالله، مجازة في التمريض, ماجستير في الصحّة العامّة، IBCLC المحقّقة الرئيسيّة وهي ستكون مسرورة للإجابة على أيّة أسئلة لديك حول هذه الدراسة.

تلفون: 01/562108 , ext: 110 فاكس: 01/562110

البريد الإلكتروني: bahia.abdallah@balamand.edu.lb

أو يمكنك الإتصال بالفريق الإشرافي:

المشرف الأوّلي البروفسور مارتن جونز البريد الإلكتروني: m.c.jones@dundee.ac.uk

الدكتورة هثير وتفورد البريد الإلكتروني: h.m.whitford@dundee.ac.uk

الدكتورة كارولين برادبوري-جونز البريد الإلكتروني:

caroline.bradbury-jones@manchester.ac.uk

شكراً لصرفك الوقت في قراءة هذه الرسالة التمهيديّة وأخذك بعين الإعتبار المشاركة في هذه الدراسة.

البيانات الديموغرافية

الجنسيّة: العمر:

عمر طفلك بالأسابيع: وزن طفلك بالغرامات:

المهنة: مكان الإقامة (في الريف أو المدينة):

المستوى العلمي (أعلى درجة علميّة أكملتها) إبتدائي تكميلي ثانوي جامعي

هل توفير حليب الثدي لطفلك؟ نعم لا

أنا أوافق على اتصالكم بي حتى أتعلّم أكثر عن هذا البحث: نعم لا

الإسم الكامل التاريخ

الإمضاء تفاصيل الإتصال:

Appendix 19: Participant Information and Consent Sheet (Mother) English and Arabic Versions

School of Nursing and Midwifery

Exploring the cultural, contextual and organisational processes that might affect the implementation of massage in the Lebanese Neonatal Intensive Care Unit (NICU) environment

Invitation to take part in a research study

You are being invited to take part in a research project. This study is important and your involvement could help many people. However, before you decide whether or not you wish to participate, we need to be sure that you understand firstly why we are doing it and secondly, what it would involve if you agree to participate. We are therefore providing you with the following information. Read it carefully and be sure to ask any questions you may have and you may wish to discuss it with other people. We will do our best to provide any information you may ask for now or later. You do not have to make an immediate decision.

Background to the study

This study explores the cultural and contextual processes within a Lebanese Neonatal Care Unit (NICU) environment that could act as facilitators and barriers for future implementation of infant massage in NICU. This research is part of a PhD study being undertaken by Bahia Abdallah at the University of Dundee, Scotland, UK. The core research team comprises: Bahia Abdallah (Principal Investigator) (PhD student at the University of Dundee), Professor Martyn Jones (University of Dundee), Dr Heather Whitford (University of Dundee), and Dr Caroline Bradbury-Jones (University of Manchester).

We want to find out the views of mothers of infants admitted to the NICU about the factors that might help to make infant massage acceptable and easy to use in the NICU. We have chosen you as a potential participant because you have an infant in NICU. We think that you could offer a great deal in terms of contributing to the study.

What does the study entail?
The study will require you to take part in a small group discussion with other women who have infants in NICU. You will only need to take part in one discussion. We expect that it may last between 1-2 hours.

Although taking part in the research may have no direct benefit to you as an individual, we hope the study will provide information that will help to improve the care of premature babies.

What are the risks?
There are no obvious risks for you in taking part in this study. However, we understand that sharing experiences may be upsetting for some participants. It is for these reasons that we will allow plenty of time after the discussion to chat about any issues that may have upset or worried you. Also, we are working in close collaboration with clinical psychologists who can provide on-going support and advice for any participants for whom this is required.

What will happen to the information?
All information collected about you during the course of the research will be kept strictly confidential. All interviews will be recorded with your permission, transcribed (typed) by the principal investigator and any identifying information will be removed so you cannot be identified. The information we collect during the group discussions will be stored electronically on the hard drive of a computer in the Nursing Program at the Faculty of Health Sciences, University of Balamand (UOB). This is the most secure form of storing data because it is password protected with a personal login. The computer is protected by the University's high level of security that include for example, spam and virus scanners. Audio recordings will then be deleted. Your responses will only appear in summaries and will be anonymised. All written informed consent forms will be stored in a locked file in the researcher's office and will be destroyed after the completion of the study.

It is the intention of the research team to share our findings through publication in journals and presentation at conferences. You will not be identified in any report/publication.

What are my rights?
Participation in the study is entirely voluntary and you are free to refuse to take part or to withdraw from the study at any time without having to give a reason and without this affecting your relationship with members of the research team or with the doctors or nurses in NICU. Reasonable travelling expenses will be paid to cover costs incurred as a result of taking part in the study.

Who has reviewed the study?
The UOB Committee on Medical Research Ethics, which has responsibility for scrutinising all proposals for medical research on humans at Saint George Hospital University Medical Centre, Ashrafieh-Lebanon, has examined the proposal and has given ethical approval. It is a requirement that your records in this research, together with any relevant records, be made available for scrutiny by monitors from the University of Balamand, Lebanon, whose role is to check that research is properly conducted and the interests of those taking part are adequately protected. The proposal has also been approved by the University of Dundee Research Ethics Committee.

For further information about this research study
Researcher: Bahia Abdallah, RN, MPH, IBCLC is the Principal Investigator and will be pleased to answer any questions you may have about this study.
Tel: 01-562108 ext: 110 Fax: 01-562110 Email: bahia.abdallah@balamand.edu.lb
Or you can contact the Supervisory team:
Primary Supervisor Professor Martyn Jones E-mail: m.c.jones@dundee.ac.uk
Dr Heather Whitford E-mail: h.m.whitford@dundee.ac.uk
Dr Caroline Bradbury-Jones E-mail: caroline.bradbury-jones@manchester.ac.uk

Thank you for taking time to read this Information Sheet and for considering taking part in the study.

Consent
I confirm that I have read and understand the information above and have been provided with the opportunity to ask any questions.

Right to withdraw
I am aware that I can withdraw from the study at any time without having to give a reason.

Voluntary consent
I have read the above statements and understand what is being requested of me. I understand that my participation is voluntary and that I am free to withdraw my consent at any time, for any reason.

On these terms, I certify that I am willing to participate in this research project.
I agree to participate in this research: YES NO

_____ _____
Participant's Name and Signature Date

_____ _____
Researcher's Name and Signature Date

Participant information sheet for mothers - Arabic Version

الملحق (الإستمارة):

إستكشاف العمليّات الثقافيّة، التنظيميّة والسياقية التي يمكن أن تؤثّر على ممارسة التدليك في محيط مركزالعناية الفائقة للخدج (NICU) اللبنانيّة.

ورقة معلومات وورقة موافقة للمشتركة (الأمّ)

دعوة للمشاركة في دراسة بحثيّة

أنت مدعوّة للمشاركة في مشروع بحثي. هذه الدراسة مهمّة ومشاركتك قد تساعد العديد من الناس. من ناحية ثانية, قبل أن تقرّري إذا كنت تودّين المشاركة أم لا, نحن نحتاج للتأكّد أنّك تفهمين أوّلاً لماذا نفعل هذا المشروع (الدراسة) وثانياً, ماذا يستلزم هذا المشروع إذا وافقت على المشاركة. إذن, نحن سنزوّدك بالمعلومات التالية. إقرئيها بحذر وتأكّدي بأن تطرحي أيّة أسئلة لديك وأسئلة قد تودّين مناقشتها مع ناس آخرين. سنفعل ما نستطيع لتزويد أيّة معلومات قد تسألين عنها الآن أم لاحقاً. ليس عليك اتخاذ قرار فوري.

خلفيّة الدراسة

هذه الدراسة تستكشف قضايا ثقافيّة وكلاميّة داخل محيط الNICU اللبنانيّة التي يمكن أن تعمل كميسّرات ومعوّقات لممارسة مستقبليّة لتدليك الأطفال في الNICU. هذا البحث هو جزء من دراسة دكتوراه لبهيّة عبدالله في جامعة داندي, اسكتلندا, بريطانيا العظمى. يتضمّن فريق البحث: بهيّة عبدالله, المحقّقة الرئيسيّة (تلميذة دكتوراه في جامعة داندي), البروفسور مارتن جونز (جامعة داندي), الدكتورة هثير وِتفورد (جامعة داندي), والدكتورة كارولين برادبوري-جونز (جامعة مانشستر).

نريد أن نعرف آراء أمّهات الأطفال المقبولين في الNICU حول العوامل التي يمكن أن تساعد في جعل تدليك الأطفال مقبولاً وسهل التطبيق في الNICU . لقد اخترناك كمشاركة محتملة لأنّ لديك طفل في الNICU. إنّنا نعتقد أنّ باستطاعتك تقديم الكثير لدى مشاركتك في هذه الدراسة.

ماذا تستلزم هذه الدراسة؟

تتطلّب منك هذه الدراسة المشاركة في مناقشة لمجموعة صغيرة مع نساء أخريات لديهنّ أطفال في الNICU. سوف تحتاجين فقط المشاركة في مناقشة واحدة. نتوقّع أنّها قد تدوم بين ساعة واحدة إلى ساعتين.

مع أنّ المشاركة في البحث قد لا تكون ذا فائدة مباشرة لك كشخص, نأمل أن تزوّدك هذه الدراسة بالمعلومات التي ستساعدك في تحسين الرعاية للأطفال المولودين قبل الأوان (الخدج).

ما هي المخاطر؟

ليس هناك مخاطر واضحة لك في المشاركة في هذه الدراسة. لكن. نحن نفهم أن المشاركة في الخبرات قد تكون مزعجة لبعض المشاركات. لهذه الأسباب سوف نخصّص الكثير من الوقت بعد المناقشة كي نتحدّث عن كل القضايا التي قد تكون مزعجة أو مقلقة لك. كذلك, نحن نعمل بتعاون وثيق مع علماء نفس عياديّين (سريريّين) قادرين على تزويد دعم ونصائح مستمرّين لكل المشاركات اللواتي تتطلّبنها.

ماذا سيحصل للمعلومات؟

كلّ المعلومات المجموعة حولك خلال حلقة البحث سوف تُحْفَظ بسريّة تامّة. كلّ المقابلات ستُسَجَّل بإذن منك, مطبوعة من قِبَل المحقّق الرئيسي وكل المعلومات المطابقة ستُزال حتى لا يعرفوا هويّتك. المعلومات التي سنجمعها خلال مناقشات المجموعة ستُخَزَّن إلكترونيّاً على الكمبيوتر في برنامج التمريض في كليّة العلوم الصحيّة, جامعة البلمند. هذه الشكل الأكثر أمناً لتخزين المعلومات لأنّها محميّة بكلمة السرّ (كلمة المرور) مع سِجِلّ شخصي . الكمبيوتر محمي من قِبَل الأمن العالي المستوى للجامعة. التسجيلات السمعيّة (الصوتيّة) سوف تُمْحى (تُشْطَب). ستظهر أجوبتك فقط كملخّصات وسوف تكون مجهولة المصدر (anonymised). كلّ إستمارات القبول المكتوبة والمبلّغ عنها ستُخَزَّن في ملف مُقْفَل (مغلق) في مكتب الباحث وسوف تُباد (تُدَمَّر) بعد إتمام الدراسة.

إنّ هدف فريق البحث هو مشاركة اكتشافاتنا من خلال نشرها في المجلاّت وتقديمها (عرضها) في المؤتمرات. سوف لن تكوني مذكورة في أي تقرير\منشور.

ما هي حقوقي؟

المشاركة في الدراسة هو إختياري بالكامل وأنت حرّة برفض المشاركة أو الإنسحاب من الدراسة في أي وقت دون إعطاء أيّ سبب ودون أن تتأثّر علاقتك بأعضاء فريق البحث أو بالأطبّاء أو بالممرّضات في الNICU. ستُدْفَع نفقات السفر المعقولة لتغطية التكاليف الحاصلة كنتيجة للمشاركة في الدراسة.

من يراجع (يستعرض) الدراسة؟

إنّ لجنة جامعة البلمند عن أخلاق البحوث الطبيّة (medical research ethics), والتي تملك مسؤوليّة فحص كلّ العروض لأجل البحوث الطبيّة على البَشَر في المركز الطبّي لمستشفى القدّيس يوسف الجامعي, الأشرفيّة-لبنان, فحصت العرض وأعطت موافقة أخلاقيّة (ethical). إنّ هذا مطلب تسجّلينه في هذا البحث, معاً مع أيّ سجلاّت مناسبة أو وثيقة الصلة بالموضوع (بالبحث), ومتاح للتدقيق من قِبَل مرشدين من جامعة البلمند, لبنان, يملكون دور التحقّق من أنّ البحث مُدار بدقّة ومصالح اللواتي شاركْنَ به محميّة بشكل كافي. إنّ العرض مُوافَق عليه أيضاً من قِبَل لجنة البحوث الأخلاقيّة (ethics) في جامعة داندي.

للمزيد من المعلومات عن هذه الدراسة البحثيّة, يمكنك الإتصال:

الباحثة: بهيّة عبدالله, مجازة في التمريض, ماجستير في الصحّة العامّة, IBCLC المحقّقة الرئيسيّة وهي ستكون مسرورة للإجابة على أيّة أسئلة لديك حول هذه الدراسة.

تلفون: 01/562108 , ext: 110 فاكس: 01/562110

البريد الإلكتروني: bahia.abdallah@balamand.edu.lb

أو يمكنك الإتصال بالفريق الإشرافي:

المشرف الأوّلي البروفسور مارتن جونز البريد الإلكتروني: m.c.jones@dundee.ac.uk

الدكتورة هثير وِتفورد: h.m.whitford@dundee.ac.uk

د. كارولين برادبوري-جونز: caroline.bradbury-jones@manchester.ac.uk

شكراً لكم لأخذ الوقت في قراءة ورقة المعلومات هذه وتفكيركم في المشاركة في هذه الدراسة.

الموافقة

أنا أثبت (أؤكّد) بأنّني قرأت وفهمت المعلومات آنفاً (أعلاه) وتزوّدت بفرصة طرح كلّ الأسئلة.

حق الإنسحاب

أنا أعي أنّني قادرة على الإنسحاب من الدراسة في أيّ وقت وبدون إعطاء أيّ سبب.

موافقة إختياريّة

لقد قرأت البيانات (الإفادات) الآنفة (أعلاه) وفهمت ماذا يُطْلَب منّي. أنا أفهم أنّ مشاركتي إختياريّة وأنّني حرّة بأن أسحب موافقتي في أي وقت, ولأيّ سبب.

بهذه العبارات، أنا أُعْلِم بثقة أنّني أودّ المشاركة في هذا المشروع البحثي.

أنا أوافق على المشاركة في هذا البحث: نعم لا

إسم المشارك(ة) والإمضاء التاريخ

إسم الباحث(ة) والإمضاء التاريخ

Appendix 20: Introductory letter to indicate interest in participation and socio-demographic background information about potential participants (HCPs)

School of Nursing and Midwifery

Exploring the cultural, contextual and organisational processes that might affect the implementation of massage in the Lebanese Neonatal Intensive Care Unit (NICU) environment

Introductory letter to indicate interest in participation in a research study

You are being invited to take part in a research project that aims at exploring the cultural and contextual processes within a Lebanese Neonatal Care Unit (NICU) environment that could act as facilitators and barriers for future implementation of infant massage in NICU. This study is important and your involvement could help many people. This research is part of a PhD study being undertaken by Bahia Abdallah at the University of Dundee, Scotland, UK. The core research team comprises: Bahia Abdallah (Principal Investigator) (PhD student at the University of Dundee), Professor Martyn Jones (University of Dundee), Dr Heather Whitford (University of Dundee), and Dr Caroline Bradbury-Jones (University of Manchester).

If you agree to be approached to learn more about the study entail and your degree of involvement, please fill the attached tear-off slip and hand it back to the to the NICU ward within 24 hours.

For further information about this research study, you can contact:
Researcher: Bahia Abdallah, RN, MPH, IBCLC is the Principal Investigator and will be pleased to answer any questions you may have about this study.
Tel: 01-562108 ext: 110 Fax: 01-562110 Email: bahia.abdallah@balamand.edu.lb
Or you can contact the Supervisory team:
Primary Supervisor Professor Martyn Jones E-mail: m.c.jones@dundee.ac.uk
Dr Heather Whitford E-mail: h.m.whitford@dundee.ac.uk
Dr Caroline Bradbury-Jones E-mail: caroline.bradbury-jones@manchester.ac.uk

Thank you for taking time to read this introductory letter and for considering taking part in the study.

On these terms, I certify that I am willing to participate in this research project.
I agree to participate in this research: YES NO

_____ _____
Participant's Name and Signature Date

_____ _____
Researcher's Name and Signature Date

Appendix 21: Participant Information Sheet and Consent Sheet (HCPs)

School of Nursing and Midwifery

Exploring the cultural, contextual and organisational processes that might affect the implementation of massage in the Lebanese Neonatal Intensive Care Unit (NICU) environment

Invitation to take part in a research study

You are being invited to take part in a research project. This study is important and your involvement could help many people. However, before you decide whether or not you wish to participate, we need to be sure that you understand firstly why we are doing it and secondly, what it would involve if you agree to participate. We are therefore providing you with the following information. Read it carefully and be sure to ask any questions you may have and if you wish to discuss it with other people. We will do our best to provide any information you may ask for now or later. You do not have to make an immediate decision.

Background to the study

This study explores the cultural and contextual processes within a Lebanese Neonatal Care Unit (NICU) environment that could act as facilitators and barriers for future implementation of infant massage in NICU. This research is part of a PhD study being undertaken by Bahia Abdallah at the University of Dundee, Scotland, UK. The core research team comprises: Bahia Abdallah (Principal Investigator) (PhD student at the University of Dundee), Professor Martyn Jones (University of Dundee, Primary supervisor), Dr Heather Whitford (University of Dundee, supervisor), and Dr Caroline Bradbury-Jones (University of Manchester, supervisor).

We want to find out the views of Health Care Professionals (HCPs) working in the NICU about the factors that might help to make infant massage acceptable and easy to use in the NICU. We have chosen you as a potential participant because of your personal experience in NICU. We think that you could offer a great deal in terms of contributing to the study.

What does the study entail?

The study will require you to take part in a small group discussion with other HCPs working in NICU at the time of the study. You will only need to take part in one discussion. We expect that it may last between 1-2 hours.

Although taking part in the research may have no direct benefit to you as an individual, we hope the study will provide information that will help to improve the care of premature babies.

What are the risks?

There are no obvious risks for you in taking part in this study.

What will happen to the information?

All information collected about you during the course of the research will be kept strictly confidential. All interviews will be recorded with your permission, transcribed (typed) by the principal investigator and any identifying information will be removed so you cannot be identified. The information we collect during the group discussions will be stored electronically on the hard drive of a computer in the Nursing Program at the Faculty of Health Sciences, University of Balamand. This is the most secure form of storing data because it is password protected with a personal login. The computer is

protected by the University's high level of security that include for example, spam and virus scanners. Audio recordings will then be deleted. Your responses will only appear in summaries and will be anonymised. All written informed consent forms will be stored in a locked file in the researcher's office and will be destroyed after the completion of the study.

It is the intention of the research team to share our findings through publication in journals and presentation at conferences. You will not be identified in any report/publication.

What are my rights?

Participation in the study is entirely voluntary and you are free to refuse to take part or to withdraw from the study at any time without having to give a reason and without this affecting your relationship with members of the research team.

Who has reviewed the study?

The UOB Committee on Medical Research Ethics, which has responsibility for scrutinising all proposals for medical research on humans at Saint George Hospital University Medical Centre, Ashrafieh-Lebanon, has examined the proposal and has given ethical approval. It is a requirement that your records in this research, together with any relevant records, be made available for scrutiny by monitors from the University of Balamand, Lebanon, whose role is to check that research is properly conducted and the interests of those taking part are adequately protected. The proposal has also been approved by the University of Dundee Research Ethics Committee.

For further information about this research study:

Researcher: Bahia Abdallah, RN, MPH, IBCLC, University of Balamand (UOB), is the Principal Investigator and will be pleased to answer any questions you may have about this study.
Tel: 01-562108 ext: 110 Fax: 01-562110 Email: bahia.abdallah@balamand.edu.lb
Or you can contact the Supervisory team:
Primary Supervisor Professor Martyn Jones E-mail: m.c.jones@dundee.ac.uk
Dr Heather Whitford E-mail: h.m.whitford@dundee.ac.uk
Dr Caroline Bradbury-Jones E-mail: caroline.bradbury-jones@manchester.ac.uk

Thank you for taking time to read this Information Sheet and for considering taking part in the study.

Consent

I confirm that I have read and understand the information above and have been provided with the opportunity to ask any questions.

Right to withdraw

I am aware that I can withdraw from the study at any time without having to give a reason.

Voluntary consent

I have read the above statements and understand what is being requested of me. I understand that my participation is voluntary and that I am free to withdraw my consent at any time, for any reason.

On these terms, I certify that I am willing to participate in this research project.

I agree to participate in this research: YES NO

_____ _____

Participant's Name and Signature Date

_____ _____

Researcher's Name and Signature Date

Appendix 22: Topic Guide for Mothers - English and Arabic Versions

School of Nursing and Midwifery

A- Personal Profile

Number and Participant pseudonym:

Age: **Nationality:**

Marital status: Single Married Separated Widow

Number of Children:

Occupation: **Place of living** (rural or urban):

Educational level (Highest level of school or education you have completed) Primary Complem. Secondary University

Approximate income in the last 12 months:

B- Interview questions

The implementation of new ways of thinking, acting and organizing in health care

- Coherence:
  How did you feel about the film? What do you like best about it?
  Tell me what do you think of infant massage as an intervention at home?
  What do you know about infant massage as a potential intervention in NICU?
  What is the meaning that you ascribe to infant massage intervention? (Value, benefit...)
- Cognitive Participation:
  How do you perceive your involvement in NICU?
  Do you feel welcomed? Are you encouraged to hold your baby? Are you encouraged to care for your baby? Is visiting hours restricted? (Defining the roles of mothers in NICU)
  Do you intend to take part in infant massage practice, if such intervention was available?
  Do you perceive any benefits, problems of massage?

The integration of new practice into existing organizational and professional settings

- Collective Action:
  What are the factors that might affect the processes of your involvement in care of your infant in NICU?
  How do you perceive the role of HCPs in facilitating your involvement in this practice?
  What are the hindering and facilitating factors that will affect your involvement?
  If we were to implement massage in the next 6 months, what it would take as key processes to consider for successful implementation? How to make it happen?
- Reflexive Monitoring:
  What are the benefits, problems in infant massage implementation in particular?
  Where do you see your involvement? What are the key issues to be sustained intervention?

Topic Guide for Mothers - Arabic Version

الإستمارة س: دليل الموضوع للأمّهات

أ- الصورة الذاتيّة
الرقم والإسم المستعار للمشاركة:
العمر: الجنسيّة:
الوضع العائلي: عزباء متزوّجة مطلّقة أرملة
عدد الأطفال:
المهنة: مكان الإقامة (في الريف أو في المدينة):
المستوى العلمي (أعلى درجة علميّة أكملتها) إبتدائي تكميلي ثانوي جامعي
الدخل التقريبي في الأشهر ال12 الأخيرة:

ب- أسئلة المقابلة
تطبيق طرق جديدة في التفكير, التمثيل والتنظيم في الرعاية الصحيّة

- الترابط**:**
ماذا شعرت بشأن الفيلم؟ ماذا أحببت فيه؟
قولي لي ما هو رأيك في تدليك الأطفال كتدخّل في البيت؟
ماذا تعرفين عن تدليك الأطفال كتدخّل محتمل في الNICU؟
ما معنى أن تنتسبي إلى تدخّل تدليك الأطفال؟ (قيمة, فائدة...)
- المشاركة المعرفيّة:
كيف ترين مشاركتك في الNICU؟
هل تشعرين أنّك مرحّب بك؟ هل تلاقين تشجيعاً لحمل طفلك؟ هل تلاقين تشجيعاً لرعاية طفلك؟
هل ساعات الزيارة محدودة؟ (تعريف أدوار الأمّهات في الNICU)
هل تنوين المشاركة في ممارسة تدليك الأطفال, إذا كان هذا التدخّل متيسّراً؟
هل ترين أيّة فوائد, مشاكل للتدليك؟

دمج لممارسة جديدة في أوضاع موجودة, مختصّة ومنظّمة

- العمل الجماعي:
ما هي العوامل التي قد تؤثّر على عمليّات تطبيق تدليك الأطفال؟
كيف ترى دور أخصّائيّي الرعاية الصحيّة في تيسيرمشاركتك في هذه الممارسة؟
ما هي العوامل التي ستؤثّر في (على) مشاركتك؟ إذا طبّقنا التدليك في ال6 أشهر التالية, ماذا ستأخذ كمفتاح عمليّات تسبّب (تقدّم) تطبيقاً ناجحاً؟ كيف يمكننا جعلها تحصل؟
- الرصد الإنعكاسي:

ما هي الفوائد, المشاكل؟ أين ترين مشاركتك؟ ما هي أهم المسائل الداعمة للتدخّل؟

Appendix 23: Topic Guide for HCPs – English and Arabic Versions

School of Nursing and Midwifery

A- Personal Profile

Number and Participant pseudonym:

Age: **Gender:**

Nationality:

Occupation, Title, Major:

Years of experience in NICU:

Educational level (Highest level of education you have completed) TS BS Masters Other-----

B- Interview questions

The implementation of new ways of thinking, acting and organizing in health care

- Coherence:
  What is your opinion about the film?
  Tell me what do you know about infant massage as a potential intervention in NICU? What is the meaning that you ascribe to infant massage intervention in general? (Value, benefit...)
- Cognitive Participation:
  Do you intend to take part in infant massage practice, if such intervention was available?
  Do you perceive any benefits, problems of massage? (Defining the roles of HCPs in NICU)

The integration of new practice into existing organizational and professional settings

- Collective Action:
  How do you perceive massage intervention will affect roles, responsibilities and training needs? Do you feel massage will be supported in the NICU environment? If we were to implement massage in the next 6 months, what it would it take as key processes to account for successful implementation? How to make it happen? How do you propose your role?
- Reflexive Monitoring:
  What do you think are the factors that might affect the processes of implementation (facilitators and barriers)? What are the key issues to be sustained intervention?

Topic guide for HCPs - Arabic Version

ملحق (الإستمارة) د : دليل الموضوع لأخصّائيي الرعاية الصحيّة (الأطباء والممرّضات)

أ- الصورة الذاتيّة

الرقم: الإسم المستعار للمشارك:

العمر: الجنس:

الجنسيّة:

المهنة, الإختصاص:

سنوات الخبرة في وحدة العناية الفائقة للخدَّج (NICU):

المستوى العلمي (أعلى مستوى في العلم أكملته) Other… Masters BS TS

ب- أسئلة المقابلة

تطبيق طرق جديدة في التفكير والتنظيم في الرعاية الصحيّة

- **الترابط/التماسك:**

ما هو رأيك حول الفيلم؟ كيف شعرت ؟ ما هي الأفكار التي راودتك؟ ماذا تعلمت؟
أخبرني ماذا تعرف عن تدليك الأطفال كتدخّل ممكن (محتمل) في الNICU ؟
ما المعنى الذي تنسبيه/تعطيه إلى تدليك الأطفال كتدخّل؟ (قيمة, فائدة...)

- **المشاركة المعرفيّة:**

هل لديك النية/ تنوين المشاركة في تطبيق تدليك الأطفال, إذا كان هكذا تدخّل متيسّراً؟
هل ترى أيّة فوائد, مشاكل للتدليك؟ (تحديد أدوار أخصّائيّي الرعاية الصحيّة، الأطباء والممرّضات)
هل تعتقدين أن المساج آمن؟ أي متى يمكن أن يبدأ؟

دمج لممارسة جديدة في أوضاع موجودة، مختصّة ومنظّمة

- **العمل الجماعي:**

كيف ترى إدخال (تدخّل) التدليك كمؤثّر على أدوار, مسؤوليّات وحاجات التدريب؟ هل تشعر أنّ التدليك سيكون مدعوماً في محيط الNICU ؟ إذا قرّرنا تنفيذ التدليك في ال6 أشهر التالية, ماذا تأخذ كمفتاح عمليّات لتقدير التطبيق الناجح؟ كيف نجعلها تحدث؟ كيف تقترح دورك؟

- **تقييم/ ورصد:**

ماذا تعتقد هي العوامل التي بإمكانها أن تؤثّر على عمليّات التطبيق(المؤثّرات والمعوّقات)؟ ما هي
أهمّ المسائل الداعمة للتدخّل؟

أهمّ المسائل غيرالداعمة للتدخّل؟(شو بخلي الأم ما تعمل مساج؟ أو تزور الNICU؟)

Appendix 24: Observation Information Sheet - English and Arabic Versions

School of Nursing and Midwifery

Information Sheet for Mothers and HCPs Relating to the Observation and Consent Form

Exploring the cultural, contextual and organisational processes that might affect the implementation of massage in the Lebanese Neonatal Intensive Care Unit (NICU) environment

Background to the study
Between January-April 2014 a research study is taking place. The purpose of the research is to explore the cultural and contextual processes within the environment of the Neonatal Care Unit (NICUs) that could act as facilitators and barriers for future implementation of infant massage. The research is part of a PhD study at the University of Dundee, Scotland, UK. The core research team comprises: Bahia Abdallah, Principal Investigator (PhD student at the University of Dundee); Professor Martyn Jones (Primary supervisor, University of Dundee); Dr Heather Whitford (Supervisor, University of Dundee); and Dr Caroline Bradbury-Jones (Supervisor, University of Manchester). It is hoped that the study will provide new insights to inform the development of appropriate health services for infants admitted to NICU as well as for mothers.

The study also involves informal and non-participant observation. Bahia Abdallah will be responsible for all forms of data collection, including the observations. The observations obtained will be used to assess naturally occurring situations during the NICU routine care. The purpose is simply to record reflections in a personal journal that will contribute to the research and these reflections are not shared with anybody. Extracts from the personal diary will be used to assist her evolving understanding of the culture of the unit, but she will not access patients' files, nursing or medical documentation. Although some general observations may be reported during dissemination (such as in the PhD thesis), complete anonymity will be assured of all those in the unit at the time of the observation. Bahia will not be involved in any way with care delivery or management activity in the unit. She will be bound by appropriate codes of conduct on confidentiality. In case you feel uncomfortable with Bahia's presence on the unit, you can contact her and she will arrange the observation in a different time shift.

What does the study entail?
During the observation periods there is no involvement expected from any members of staff or any patients or relatives. The observation will be done unobtrusively and will not interfere with any aspect of clinical care. Although the research may have no direct benefit to you as an individual, we hope the study will provide new insight into the most effective ways of meeting the holistic approach in health care delivery. This insight can be used to inform the development of appropriate health services for infants admitted to NICU as well as for mothers.

What are the risks?
There are no obvious risks for you in taking part in this study.

What will happen to the information?
All information collected during the course of the research will be kept strictly confidential. Observed participants will not be identified in any report/publication.

What are observed participants' rights?
Participation in the study is entirely voluntary. Everybody concerned in the NICU will be made aware that observations are made anonymously and without names being recorded. Participants who are unhappy with this, could 'opt out', in which case observations regarding particular interactions that they are involved in will not be included in the diary or would be removed from the diary and destroyed. In case anybody feels uncomfortable, they can directly contact the researcher or the manager of the unit and the observation will then be carried out in a different time shift.

Who has reviewed the study?
The UOB Committee on Medical Research Ethics, which has responsibility for scrutinising all proposals for research on humans at Saint George Hospital University Medical Centre, Ashrafieh-Lebanon, has examined the proposal and has given ethical approval. It is a requirement that your records in this research, together with any relevant records, be made available for scrutiny by members of the research team from the University of Balamand, Lebanon, whose role is to check that research is properly conducted and the interests of those taking part are adequately protected. The proposal has also been approved by the University of Dundee Research Ethics Committee.
For further information about this research study

Researcher: Bahia Abdallah, RN, MPH, IBCLC, University of Balamand (UOB), is the Principal Investigator and will be pleased to answer any questions you may have about this study. Tel: 01-562108 ext: 110 Fax: 01-562110 Email: bahia.abdallah@balamand.edu.lb

Thank you for taking time to read this Information Sheet.

Information sheet for Mothers and HCPs- Arabic Version

ملحق (إستمارة)

ورقة المعلومات واستمارة الموافقة للأمّهات وأخصّائيي الرعاية الصحيّة (أطبّاء وممرّضات) المتعلّقة بالمراقبة.

إستكشاف العمليّات الثقافيّة، التنظيميّة والسياقية التي يمكن أن تؤثّر على ممارسة التدليك في محيط مركزالعناية الفائقة للخدج (NICU) اللبنانيّة.

خلفيّة الدراسة
بين كانون الثاني – نيسان 2014 دراسة بحثيّة تحدث. إن هدف البحث هو استكشاف قضايا ثقافيّة وكلاميّة داخل محيط الNICUS التي يمكن أن تعمل كميسّرات ومعوّقات لممارسة مستقبليّة لتدليك الأطفال. هذا البحث هو جزء من دراسة دكتوراه لبهيّة عبدالله في جامعة داندي, اسكتلندا, بريطانيا العظمى. يتضمّن فريق البحث: بهيّة عبدالله, المحقّقة الرئيسيّة (تلميذة دكتوراه في جامعة داندي), البروفسور مارتن جونز (المشرف الأوّلي, جامعة داندي), الدكتورة هثير وتفورد (مشرفة, جامعة داندي), والدكتورة كارولين برادبوري-جونز (مشرفة, جامعة مانشستر). نأمل أن تزوّد الدراسة تعمق بالمعرفة للإبلاغ عن التطوّر في الخدمات الصحيّة الملائمة للأطفال المقبولين في الNICU
بالإضافة إلى الأمّهات.

تستلزم الدراسة أيضاً مراقبة غير رسميّة وغير مشتركة. ستكون بهيّة العدالله مسؤولة عن كلّ أشكال جمع المعلومات, متضمّنةً (بما فيها) المراقبات. المراقبات التي تمّ إحرازها ستُسْتَعْمل في تقييم الحالات الطبيعيّة الموجودة خلال الرعاية الروتينيّة في الNICU. الغاية, بكلّ بساطة, هي تسجيل أفكار في مجلّة شخصيّة التي ستسهم في البحث وهذه الأفكار لن تتشارك مع أيّ إنسان. المقتطفات من اليوميّات الشخصيّة ستُسْتَعمل لمساعدة فهمها المتطوّر لثقافة الوحدة, لكنّها لن تصل لملفّات المرضى, الوثائق التمريضيّة أو الطبيّة. بهيّة لن تشترك بأيّة طريقة في إعطاء الرعاية أو إدارة النشاطات في الوحدة. سوف تكون ملائمة من الإدارة (السلوك) وتحافظ على السريّة. في حال شعورك بعدم الراحة بحضورالباحثة بهيّة عبدالله في الوحدة, يمكنك الإتصال بها وهي سوف ترتّب المراقبة في وقت مناوبة مختلف.

ماذا تستلزم هذه الدراسة؟
خلال فترات المراقبة لم يكن هناك مشاركة متوقّعة من كلّ أعضاء فريق العمل أو أيّ مرضى أو أقرباء. ستُنْجَز المراقبة بتحفظ وسوف لن تتدخّل بأي وجه (مظهر) من الرعاية السريريّة. مع أنّ البحث قد لا يمتلك فائدة مباشرة لك كشخص (فرد), نحن نأمل أن تعطي هذه الدراسة أفقاً جديداً في الطرق الأكثر فعاليّة بشأن النهج الشمولي في الرعاية الصحيّة. نتائج الدراسة يمكن أن تُسْتَعمل في الإبلاغ عن تطوّر الخدمات الصحيّة الملائمة للأطفال الداخلين إلى الNICU بالإضافة إلى الأمّهات.

ما هي المخاطر؟
ليس هناك مخاطر واضحة لك في المشاركة في هذه الدراسة.

ماذا سيحصل للمعلومات؟
كلّ المعلومات المجموعة حولك خلال حلقة البحث سوف تُحْفَظ بسريّة تامّة. المشاركون الذين تحت المراقبة سوف لن يُعْرَفوا (يُذْكَروا) في أيّ تقرير\منشور.

ما هي حقوق المشاركين (المشاركات) الذين هم (اللواتي هنّ) تحت المراقبة؟
المشاركة في هذه الدراسة إختياريّة بالكامل. كل الناس المهتمّين بالNICU سوف يُجْعَلون واعيين بأنّ المراقبات معمولة بطريقة غير مسمّاة (مجهولة الإسم أوالمصدر)(anonymously) وبدون أسماء مسجّلة. المشاركون الذين ليسوا سعداء بهذا, يمكنهم أن يختاروا الخروج (opt out), وفي هذه الحالة المراقبات بشأن التفاعلات الهامة (الخصوصيّة) التي يشتركون فيها لن تكون ضمن اليوميّات أو ستُزال من اليوميّات وتُدَمَّر (تُباد). في حالة شعور أي إنسان بعدم الراحة, يمكنهم مباشرة الإتصال بالباحث أو مدير الوحدة وسوف تُنْقَل المراقبة إلى وقت مناوبة مختلف (آخر).

من يراجع (يستعرض) الدراسة؟

إنّ لجنة جامعة البلمند عن أخلاقيات البحوث الطبيّة (medical research ethics), والتي تملك مسؤوليّة فحص كلّ العروض لأجل البحوث الطبيّة على البَشَر في المركز الطبّي لمستشفى القدّيس يوسف الجامعي, الأشرفيّة-لبنان, فحصت العرض وأعطت موافقة أخلاقيّة. إنّ هذا مطلب تسجّلينه في هذا البحث, معاً مع أيّ سجلاّت مناسبة أو وثيقة الصلة بالموضوع (بالبحث), ومتاح للتدقيق من قِبَل أعضاء فريق البحث من جامعة البلمند, لبنان, يملكون دور التحقّق من أنّ البحث مُدار بدقّة (properly conducted) ومصالح اللواتي (الذين) شاركْنَ (شاركوا) به محميّة بشكل كافي. إنّ العرض مُوافَق عليه أيضاً من قِبَل لجنة البحوث الأخلاقيّة في جامعة داندي.

للمزيد من المعلومات عن هذه الدراسة البحثيّة, يمكنك الإتصال:
الباحثة: بهيّة عبدالله, مجازة في التمريض, ماجستير في الصحّة العامّة, IBCLC, جامعة البلمند, وهي المحقّقة الرئيسيّة وسوف تكون مسرورة للإجابة على أيّة أسئلة لديك حول هذه الدراسة.
تلفون: 01/562108 , ext: 110 فاكس: 01/562110
البريد الإلكتروني: bahia.abdallah@balamand.edu.lb

شكراً لكم لأخذ الوقت في قراءة ورقة المعلومات هذه.

Appendix 25: Observation Consent Form Obtained from the Clinical Staff Responsible for the NICU - English and Arabic Versions

School of Nursing and Midwifery

I confirm that I have read and understand the information above and have been provided with the opportunity to ask any questions.

Voluntary consent

I have read the above statements and understand what is being requested of me. I will introduce the researcher to the team members and explain that the rationale for the non-participant observation is to observe team work in NICU and not individual performance. I understand that participation is voluntary. I will make it clear to participants who are uncomfortable being observed that they can directly contact me or the researcher and the particular interactions that they are involved in will not be included in the diary or would be removed from the diary and destroyed. The observation will then be carried out in a different time shift.

On these terms, I certify that I am willing to participate in this research project.
As the NICU manager, I agree to participate in this research: YES NO

_____ _____

Name and Signature Date

_____ _____

Researcher's Name and Signature Date

Consent for Observation – Arabic Version

الموافقة المتعلّقة بالمراقبة

أنا أثبت (أؤكّد) بأنّني قرأت وفهمت المعلومات آنفاً (أعلاه) وتزوّدت بفرصة طرح كلّ الأسئلة.

حق الإنسحاب

أنا أعي أنّني قادرة على الإنسحاب من الدراسة في أيّ وقت وبدون إعطاء أيّ سبب.

موافقة إختياريّة

لقد قرأت البيانات (الإفادات) الآنفة (أعلاه) وفهمت ماذا يُطْلَب منّي. أنا أفهم أنّ مشاركتي إختياريّة وأنّني حرّة بأن أسحب موافقتي في أي وقت, ولأيّ سبب.

بهذه العبارات، أنا أُعْلِم بثقة أنّني أودّ المشاركة في هذا المشروع البحثي.

أنا أوافق على المشاركة في هذا البحث: نعم لا

إسم المشارك(ة) والإمضاء التاريخ

إسم الباحث(ة) والإمضاء التاريخ

Appendix 26: University of Dundee Ethics Committee Approval

School of Nursing and Midwifery

UNIVERSITY OF DUNDEE RESEARCH ETHICS COMMITTEE APPLICATION FORM

Project title: Exploring the cultural, contextual and organisational processes that might affect the implementation of massage in the Lebanese Neonatal Intensive Care Unit (NICU) environment

Lead Investigator

Name: Bahia Abdallah (PhD student, University of Dundee, School of Nursing and Midwifery)

School/Department: School of Nursing and Midwifery

University mail address: University of Dundee, Nethergate, Dundee, DD1 4HN, Scotland, UK

E-mail address: bahia.abdallah@balamand.edu.lb **Phone:** 00961 3 113516

Staff ☐

Student ☒ **Supervisor's name** Professor Martyn Jones (Primary supervisor, University of Dundee, School of Nursing and Midwifery)

Other academic staff involved

Name	School/Department	E-mail address
Dr Heather Whitford	University of Dundee, School of Nursing and Midwifery	h.m.whitford@dundee.ac.uk
Dr Caroline Bradbury-Jones	University of Manchester	caroline.bradbury-jones@manchester.ac.uk

Project start date: January, 2014	**Project duration:** December, 2014
Date application submitted: January 5, 2014	**UREC Ref no. (LEAVE BLANK):**

YOU MUST ANSWER ALL QUESTIONS		YES	NO	N/A
1	Will you describe the main procedures in advance to participants so that they are informed about what to expect in your study?	☒	☐	☐
2	Will you tell participants that their participation is voluntary?	☒	☐	☐
3	Will your participants be able to read and understand the participant information sheet?	☒	☐	☐
4	Will you obtain written informed consent for participation?	☒	☐	☐
5	If the research is only observational (i.e. no experimental intervention or direct contact), will you ask participants for their consent to being observed?	☒	☐	☐
6	Will you tell participants that they may withdraw from the research at any time without penalty and for any reason?	☒	☐	☐
7	With questionnaires, will you give participants the option of omitting questions they do not want to answer?	☒	☐	☐
8	Will you tell participants that their data will be treated with full confidentiality and that, if published, it will not be identifiable as theirs?	☒	☐	☐
9	Will you give participants a brief explanation of the purpose of the study at the end of their participation in it, and answer any questions?	☒	☐	☐
10	Will your project involve deliberately misleading participants in any way? If YES, you must provide a justification in the research protocol.	☐	☒	☐
11	Is there any realistic risk of any participants experiencing either physical or psychological distress or discomfort? If **YES**, give details in the research protocol and state what you will tell them to do if they should experience any problems (e.g. who they can contact for help).	☒	☐	☐
12	Do the participants fall into any of the following special groups? If the answer is YES, indicate which group(s) by checking the appropriate box(es):	☒	☐	☐

☐ Children (under 18 years of age)
☐ Children (under 5 years of age)
☐ People with disability such as learning or communication difficulties.
Please specify disability:
☐ Pregnant women
☐ People studied with respect to contraception or conception
☐ People in custody
☐ People engaged in illegal activities (e.g. drug-taking)
☐ Non-human animals
☒ Patients
☐ More than 5000 participants

NOTE: You may also need to obtain clearance from Disclosure Scotland or an equivalent authority.

You must check **either Box A or Box B** below and provide all relevant information in support of your application. If you answered **NO** to any of questions 1-9, or YES to any of questions 10-12 (with a pink background), then you **must** check Box B.

A: ☐	I consider that this project has **no** significant ethical implications to be brought to the attention of the University Research Ethics Committee.

Please provide a short study protocol in a separate document. The accompanying notes give additional information about how to write the protocol. Your protocol **must** include the following sections, and any others you think are necessary:

1. Project title.
2. Background information.
3. Aims and objectives of the study.
4. Brief description of participants and recruitment methods.
5. Brief description of the research methods and measurements. Include details of how the data will be securely stored.
6. Arrangements for participant information, consent and debriefing.
7. Estimated start date and duration.

You must also provide the intended Participant Information Sheet(s) and Consent Form(s), as well as copies of any questionnaires and details of interview questions you plan to use.

B: ☒	I consider that this project may have ethical implications that should be brought to the attention of the University Research Ethics Committee.

Please provide a short study protocol in a separate document. The accompanying notes give additional information about how to write the protocol. Your protocol **must** include the following sections, and any others you think are necessary:

1. Project title.
2. Background information.
3. Aims and objectives of the study.
4. Brief description of participants and recruitment methods.
5. Brief description of the research methods and measurements. Include details of how the data will be securely stored.
6. A clear statement of the ethical considerations raised by the project and how you intend to deal with them.
7. Arrangements for participant information, consent and debriefing.
8. Estimated start date and duration.

You must also provide the intended Participant Information Sheet(s) and Consent Form(s), as well as copies of any questionnaires and details of interview questions you plan to use.

Declaration

I am familiar with the University of Dundee *Code of Practice for Non-clinical Research Ethics on Human Participants*, which I have discussed with the other researchers involved in the project. I confirm that my research abides by these guidelines.

Signed ..... Date: January 5, 2014

(Lead Investigator) Bahia Abdallah

For undergraduate or postgraduate students:

Signed ..... Date: 7·1·14

(Supervisor) HEATHER M. WHITFORD

There is an obligation on the Lead Researcher to bring to the attention of the Ethics Committee any issues with ethical implications not covered by the above checklists.

Appendix 27: University of Dundee Ethics Committee Approval for Observation

School of Nursing and Midwifery

Opinion of the University of Dundee research ethics Committee (UREC) concerning observation in NICU

The opinion of the University of Dundee research ethics Committee (UREC) was sought concerning the level of consent required for participants. Extract from the communication with the chair of UREC is as follows:

"*In this case permission from the hospital and the clinical staff who run the unit would suffice, as long as everybody is made aware that Bahia is there as a researcher and that she will simply recording reflections for her own use and that these reflections are not shared with anybody. If it is at all possible, maybe staff who are unhappy with this, could 'opt out', in which case observations regarding particular interactions that they are involved in could not be included in the diary*".

Appendix 28: Qualitative Investigation UREC 14002 Abdallah - additional approval: Amendment Request and Approval

Request:
From: "Bahia Abdallah (PG Research)" <B.Abdallah@dundee.ac.uk>
Date: Thursday, 26 March 2015 15:39
To: Astrid Schloerscheidt <a.schloerscheidt@dundee.ac.uk>
Cc: "Martyn Jones (Staff)" <m.c.jones@dundee.ac.uk>, "Heather Whitford (Staff)" <h.m.whitford@dundee.ac.uk>, Caroline Bradbury-Jones <c.bradbury-jones@bham.ac.uk>, "bahia.abdallah@balamand.edu.lb" <bahia.abdallah@balamand.edu.lb>
Subject: Reference: Qualitative investigation UREC 14002 Abdallah
Dear Dr. Schloerscheidt,
Greetings,
My name is Bahia Abdallah and I am a part time PhD student at the school of Nursing and Midwifery at the University of Dundee. I was granted IRB approval from UREC-UOD on January 2014 reference number: 14002 Abdallah to conduct a qualitative investigation in Lebanon. The study aims at understanding the cultural, organizational and contextual factors that might affect future implementation processes of infant massage within a Lebanese Neonatal Intensive Care Unit (NICU) environment.
In my proposal, I was planning to recruit mothers in the focus groups for data generation, in addition to health care providers (HCPs). To my surprise, the invited mothers who consented to participate were accompanied by other members of the family such as: husband, mother in law, and sister in law and grandmother. The topic was of interest to them that drove them to show up. Some of the participants (grandmothers, sister in laws and mothers in law) requested to participate as they were used to do massage for their full-term infants. For them, infant massage is considered as a culturally practiced intervention. Therefore, I did not refuse their request for participation. In fact, the generated data from them was very meaningful and enriching to the discussions and allowed for maximum heterogeneity involvement; which is in line with the exploratory nature of this qualitative investigation.
I explained this fact to the Research Committee at the University of Balamand (UOB-IRB), Faculty of Medicine and Medical Sciences in Beirut-Lebanon (where the study is conducted; and I have already received approval and permission to add relatives and to include additional members of the family in my study.
Therefore, I would like to seek your permission regarding adding other participants than the mothers to my research data collection as it adds richness to my PhD dissertation.
Looking forward to receiving your approval, and thank you for your kind consideration
Sincerely,
Bahia Abdallah
Approval:
Astrid Schloerscheidt (Staff)
Fri 3/27/2015, 7:43 PM
Bahia Abdallah (PG Research); Martyn Jones (Staff); Heather Whitford (Staff); Caroline Bradbury-Jones <c.bradbury-jones@bham.ac.uk>; bahia.abdallah@balamand.edu.lb;

Dear Bahia,
Many thanks for the information and the request for an amendment to the protocol. I am happy to grant permission for this amendment.
Best,
Astrid

Appendix 29: University of Balamand Internal Review Board (Ethics) Approval

RESEARCH COMMITTEE / INSTITUTIONAL REVIEW BOARD (IRB)
APPROVAL CHECKLIST

Date: Dec. 10, 2013

Applicant: Bahia Abdallah, **Degree:** BSN, MPH, IBCLC

Dept. / Division: Lecturer, FHS-UOB and PhD student at University of Dundee **Rank:**

Co-Investigator(s): Professor Martyn Jones (Primary supervisor, University of Dundee), Dr Heather Whitford (University of Dundee), Dr Caroline Bradbury-Jones (University of Manchester).

Project Title: Exploring the cultural, contextual and organisational processes that might affect the implementation of massage in the Lebanese Neonatal Intensive Care Unit (NICU) environment

Department Chairperson

The attached project is significant and is compatible with the academic programs of the Department:

Name	Signature	Date
Nadia Rizk		Dec. 13, 2013

Faculty Research Committee / I.R.B.

The attached project has been reviewed and approved:

Chairperson	Signature	Date
Laila Fahed		13.12.13

Medical Ethics Committee

The attached project has been reviewed and approved:

Chairperson	Signature	Date
Prof. Chawki Cortbaoui Chirurgie Orthopédique		20-12-13

Dean

The proposed research is consistent with the academic programs of the Faculty

Name	Signature	Date
Camille Nassar		2/1/2014

Comments:

Appendix 30: Thematic Framework for the Data Generated from the First Focus Group

Categories and codes

I. Staff perception about the film	
I.1 Positive perception	"Very nice" "I loved it"
I.2 Feasibility of application	"It can be done. It is not a strange idea" "we usually do massage with oil after baby bath but not for that long"

II. Definition of infant massage by participants	
II.1 Perceived benefits of massage	"It soften and hydrates the skin and prevent skin breaks"

III. Nurses' knowledge and perception about infant massage	
II.1 Effect on the baby (physical, psychological and relational)	
II.1.1 relaxing	"He relaxes"
II.1.2 comforting	"He feels more comfortable after doing oil massage"
II.1.3 better sleep	"He sleeps better after massage"
II.1.4 No pain	"He does not feel pain". "He does not cry"
II.1.4 soften baby skin	"It soften and hydrates the skin and prevent skin breaks"
II.1.5 Better intelligence	"Baby will become more intelligent, better interaction with his mum"
II.2 Effect on the mother	
II.2.1 Better mother –infant interaction and Bonding	"Promotes interaction and bonding between mum and baby especially that they are separated"
II.2.2 Decrease the fear of the mother	"The mother will overcome her fears of touching her baby in the incubator….break the ice…" "Some mothers think that the baby is so fragile that he might brakewhen handled"
II.2.3 Better attachment/acceptance	"The mother will accept her baby and get used to touch him and this makes her more closer and attached to him"
II.2.4 Understand baby cues	"The mother with time will be able to understand her baby cues better"
II.2.5 decreases stress and postpartum blues	Nurses reported that the mother will have less stress and postpartum blues if encouraged and allowed to care for her baby in NICU
II.3 Effect on the caregiver	

II.3.1 relaxing and satisfying feeling	"I feel better and satisfied after doing the oil massage for the baby after bath" I feel I did all the care needed ….having addded something beneficial…a positive human touch and not only doing painful procedures…"
II.3.2 Communication mean	"This is a way of communication between the baby and me…. he can understand my touch"
II.3.3 helps to build the trust relation between mother and caregiver	When the mum sees the nurse doing massage with oil to her baby, this will enhances the trust relationship that nurses are taking good care of their babies. "Act of caring"

IV. Doctors' knowledge and percption about infant massage	
III.1 Effect on the baby	
III.1.1 relaxing	
III.1.2 comforting	
III.1.3 better sleep	"Baby sleeps better after massage"
III.1.3 less colic	"I do it in my clinic it decreases the colic"

V. Barriers	
IV.1 Barriers related to the health care providers	
IV.1.1 lack of experience and information about infant massage	"It is not part of the educational curricula" " no training yet" Medical staff reluctance**:** Lack of experience with the process. Belief that technology is better than massage Nursing staff reluctance: Nurses' feelings that massage might add to their work load. Lack of information about the right technique of massage and how it is done and on which babies it is done.
IV.1.2 Inconsistency in practice	Concerns for insufficient time and lack of motivation in some nurses to administer massage on daily basis and to stay next to the mother to guide and support her while doing massage.
IV.1.3 Resistance to practice	One participant doctor said: "There is always resistance at the beginning to practice new interventions…. It will take around 6 months to become a routine care….as we did in the nesting procedure, remember…"
IV.1.3 Safety issues for critical and very low birth weight infants	Fear of accidental arterial or venous line dislodgement. "If the baby is in distress, he

	cannot be touched…desaturation…"
IV.2 Barriers related to the health care system	
IV.2.1 lack of guidelines for massage intervention	"No checklist available". "The institution will require project quality indicators before implementation of any new intervention"
IV.3 Barriers related to the mother/family situation	
IV.3.1 medical condition	One participant said: "If the mother is sick or had complications or had a twin delivery and one is dead, it will be hard for her to come to the NICU"
IV.3.2 transportation issues	"Some parents are not able to come daily to the NICU"
IV.3.3 concerns for insufficient time for mothers to administer massage daily	"Some mothers have other children at home and cannot spend time in NICU"
IV.3.4 concerns that the mother will panic/fear of touching the baby	"First time the mother will be in panic when she sees the massage on her baby….she refuses to touch her baby"
IV.3.5 mother refusal/ maternal stress, anxiety and fear	"Some mothers will develop baby blues and refuse their babies". "not all mothers accepts massage"
IV.3.6 Physical environment of the NICU	No place for the mother to sleep overnight in NICU

VI. Facilitators	
V.1 Feasibility of application related to the health care providers/Role of the staff	Willingness to apply the massage by the medical and nursing team
V.1.1.cultural acceptability	"Yes we can do it" "it is part of our culture". "In the old time, our grand parents and parents were used to do it". One participant said: "my mother used to do it to my daughter with stretching exercises…. using olive oil". One participant doctor said that it can be done for sure. "it is easy to apply". " I do it in my clinic for colic relief"
V.1.2.Teaching opportunity for nurses	"To learn new skill, I will feel more confident"
V.1.3.Teaching opportunity for mothers	Nurses reported that this is a good opportunity for them to teach the mother about her infant cues and how to care for him before and after discharge
V.1.4 Medical team is supportive to nurses	Nurses reported that the medical team trust and support nurses. "They trust us in the care we do".
V.1.5 Nursing team is supportive of the idea (do group talk)	Nurses are enthusiastic about it. They reported that it can be done for sure and that they are already involving mothers in doing oil application after bath on their

	babies.
V.1.6 Nursing team is available for support during day and night shifts/staff attitude/assistance with infant care	The HN said:"Nurses here are passionate and kind and considers the infant as a diamond". "Some babies are very precious to their parents after 12 years of trials to get pregnant… we assist parents day and night…"
V.1.7 Trust relationship between nurses and parents	"Parents trust us and know that their babies are in good hands". Caring nurses.
V.2 Feasibility of application related to the health care system	The health care system in our institution is supportive if the intervention proved to be beneficial to the baby. One participant doctor said: "we put clear inclusion/exclusion criteria for the application of massage…. Babies with NEC, unstable infants, on respirator, intubated…will be excluded"
V.2.1 Teaching hospital	"It is a teaching hospital….we encourage EBM".
V.2.2 Minimal restriction for parents' visitation/NICU environment	Parents (mother and father) can visit any time day and night their infant in NICU except when baby is in distress or during doctors' rounds or any invasive procedure
V.2.3 Willingness to do training workshop to nurses and doctors about massage	Participants agreed that a training workshop should be done about massage and then to come up with guidelines for routine application and documentation. "Soins quotidien" and "documentation and record keeping"
V.2.4 Minimal financial burden on the administration	"It does not cost as an intervention" versus previous experience in nesting with positioning aids
V.2.5 Improved quality of care	"The institution requires project quality indicators…"

Appendix 31: Example of Charting

The implementation of new ways of thinking, acting and organizing in health care

NPT construct

1. Coherence=sense-making=understanding it in order to promote or inhibit the routine embedding of massage in NICU, allow exploration of process issues

Research questions

2. Explore the perceptions and attitudes of HCPs concerning massage as a potential intervention provided by mothers;
5.Understand the interplay between the cultural, contextual and organisational factors that might influence future implementation processes of infant massage in Lebanese NICUs;

Topic guide questions:

What is your opinion about the film? Tell me what do you know about infant massage as a potential intervention in NICU? What is the meaning that you ascribe to infant massage intervention in general? (Value, benefit...).

Theme 1. Perception of the film: understanding of massage and touch as an intervention in NICU, create awareness

	Hospital A: Focus Group1-HCPs (HN1=Fida, SN2=Maria, SN3=Roula, Dr.=Claudia)	**Descriptive summaries and interpretation**
1.1 Familiar/Acceptance and positive/easy/feasibility/similar to existing practice /Impression about the premature baby/benefits as skin hydration/acceptable to mother and baby/ Home setting and massage **Technique, application and outcome**	*Maria: beautiful and nice and it is not strange to us… it is not a strange idea, I mean, we do these things, may be not for that long. But at least, we usually do massage like movement with oil after baby bath, and even on every "tourneh" (round on the baby every 3 hours), I mean, if the baby is intubated, every 3 hours; if his skin is a little bit dry or something, we apply a crème (oil) and we apply in the same movement, more or less I mean* */Roula: yes we do same thing more or less. The film we watched is very nice. I loved it. We do this kind of care, I mean, we hydrate the skin of the baby if it is dry, and you feel he feels more comfortable after doing oil massage, …P3* */Fida: Very nice video. Is is nice. P4* *//M: you feel happy and you feel that you know these things. You feel also that you should do this care with every baby. P6.* */ Claudia: Very good/I do it in my clinic it decreases the colic. I have been doing this for 20 years in my clinic for colic relief. I teach this technique to parents, but not all people are ready to do this. Yet, in the case of premature baby, we can because parents are very concerned and feel stressed about their baby and they want to do for them such intervention. P13.*	After watching the video, all the staff in FG 1 from hospital A agreed that massage is a nice idea, acceptable and easy to implement. They considered massage as an essential practice applied years ago in their unit. They said it is a familiar practice that they usually do it with oil application for infants after daily bath and even on every round (every 3 hours) if needed. *FG1, Maria (SN): beautiful and nice and it is not strange to us… it is not a strange idea, I mean, we do these things, may be not for that long. But at least, we usually do massage like movement with oil after baby bath, and even on every "tourneh"… (round on the baby every 3 hours), I mean, if the baby is intubated, every 3 hours; if his skin is a little bit dry or something, we apply a crème (oil) and we apply in the same movement, more or less I mean with pressure (FG1, P3).* M: because you feel the baby is not annoyed; on the contrary, you feel **he relaxes** after you massage him. Eh, you do not just put, no, you **make a little pressure (FG 1, P4)** Moreover, Claudia said *(Neonatologist and Paediatrician)*: *I have been doing this for 20 years in my clinic for colic relief. I teach this technique to parents, but not all people are ready to do this.* She added: *Yet, in the case of premature baby, we can because parents are very concerned and feel stressed about their baby and they want to do for them such intervention.*
1.2 historic context/tradition/cultural practice/intergenerational traditions		

Theme 2. Benefits of massage: Understanding the value, benefits and importance of a massage in NICU for the baby		
2.1 Perceived benefits and purpose of massage/ Understanding the value of massage for infants in NICU. Psychological and relational benefits (Relaxing/content/happy/ Calming effect/human contact as a fundamental need, touch as a mean of communication) /support for the baby	**Technique and benefits** *Maria: because you feel the baby is not annoyed; on the contrary, you feel he relaxes after you massage him. Eh, you do not just put, no, you make a little pressure. P3* */ R: you feel he feels more comfortable after doing oil massage. P3.* *//M: yes, now we feel that when we do massage to the baby, he sleeps better after it. Most of time we feel that the baby feels more comfortable after doing oil massage P6* */M: now, for example, commenting on your talk; for example, the first time they see you are doing it, "some mothers think that the baby is so fragile and feel afraid that he might break when handled". They yell at me "oh, you have broken him"- You know- so I do it on purpose and tell her: watch me, nothing happened to him; he is comfortable, he is happy, he does not feel pain, he does not cry. You know, you will teach them little by little and they will like it, eh…P6* */Roula: And according to us, if you do the care for the baby, you make him relaxed and comfortable after the bath and after any round you do it to him. Like Maria said, you do not only put IV for him and take blood samples. You also feel that the baby is comfortable when we do oil massage.P9* *// Fida: some babies are intubated and very agitated, when you do massage for him, you fondle him, and he will relax and sleep. This is the caress. Also our children request from us to fondle them. P31* */F: also, there is something very nice, when the baby is sleeping and does not wake up, we do massage for him, we rub his back, his legs, his eh… like this, and he will wake up and feel very relaxed sometimes. But when you wake him up, you should teach the mother. P31* */M: yes, he sleeps profoundly after being with his mother, he sleeps…P31*	All nurses agreed that massage is a fundamental need, relaxing, comforting for the baby and helps him to sleep. *FG1, Roula (SN): you feel he feels more comfortable after doing oil massage. P3.* *FG1, Fida (HN): Some babies are intubated and very agitated, when you do massage for him, you fondle him, and he will relax and sleep. This is the caress. Also our children request from us to fondle them….. also, there is something very nice, when the baby is sleeping and does not wake up, we do massage for him, we rub his back, his legs, his eh… like this, and he will wake up and feel very relaxed sometimes. But when you wake him up, you should teach the mother. P31*

2.2 Physiological and developmental benefits: counter to pain, colic/ Positive and important for physical growth/ Better circulation / Increased intelligence as an outcome	*Roula: We do this kind of care, I mean, we hydrate the skin of the baby if it is dry, and you feel he feels more comfortable after doing oil massage, especially if he is an intubated baby lying on his back supine position, and you do massage to him for the sake of the **circulation of the extremities**. Now, you cannot turn his back very much, we do on the abdomen.P3* */Fida: we put few drops, not many especially for the premature baby because it **hydrates the skin and nourishes it**. There are electrolytes in it, I mean; this is only under doctor's order (selon ordre medical), and it is very nice.P4* */Maria: Maybe **the smallest thing will cause him pain**. I mean this dryness will, for sure, produce lots of pain, and on the top of that, you are injecting him. He will, for sure, **feel comfortable with massage**. P8* *// F: I feel it is 100% beneficial and it gives a lot to the mother and infant relationship, approach and caress; everything and even the **baby will become more intelligent**; you see that through his looks. P11* *//Claudia: Very good…I do it in my clinic it decreases the colic. I have been doing this for 20 years in my clinic for colic relief. P13.*	All HCPs in FG1 have showed positive views of the impact of massage on the physical, developmental and the general wellbeing of the infant. *FG1, Maria (SN): Maybe **the smallest thing will cause him pain**. I mean this dryness will, for sure, produce lots of pain, and on the top of that, you are injecting him. He will, for sure, **feel comfortable with massage**. P8* The head nurse Fida in Hospital A perceived that massage promotes bonding and is beneficial for the dyad baby and the mother and that massaged infant will become more intelligent. *FG1, Fida: I feel it is 100% beneficial and it gives a lot to the mother and infant relationship, approach and caress; everything and even the **baby will become more intelligent**; you see that through his looks. P11* *FG1, Claudia: Very good…I do it in my clinic it decreases the colic. I have been doing this for 20 years in my clinic for colic relief. P13*

Appendix 32: Example of Mapping and Interpretation

The implementation of new ways of thinking, acting and organizing in health care

NPT construct

1. Coherence=sense-making=understanding it in order to promote or inhibit the routine embedding of massage in NICU, allow exploration of process issues

Research questions

2. Explore the perceptions and attitudes of HCPs concerning massage as a potential intervention provided by mothers;
5. Understand the interplay between the cultural, contextual and organisational factors that might influence future implementation processes of infant massage in Lebanese NICUs;

Topic guide questions:

What is your opinion about the film? Tell me what do you know about infant massage as a potential intervention in NICU? What is the meaning that you ascribe to infant massage intervention in general? (Value, benefit...).

Theme 1. Perception of the film: understanding of massage and touch as an intervention in NICU, create awareness

	Hospital A: Focus Group1-HCPs (HN1=Fida, SN2=Maria, SN3=Roula, Dr.=Claudia)	**Descriptive summaries and interpretation**
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1.2 historic context/tradition/cultural		

practice/intergenerational traditions		
Theme 2. Benefits of massage: Understanding the value, benefits and importance of a massage in NICU for the baby		
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Appendix 33: Example of Comparing and Contrasting Emerging Themes for Parent Focus groups

Overall themes that emerged from analysis mapped to the research questions and NPT

Theme	Sub-theme	Contributing factors	Research question	NPT construct	Example
1.Perception and attitudes of parents about infant massage	1.1 Familiar 1.2 Cultural context and intergenerational tradition	Participants' characteristics such as: Age, gender. Social rituals	What are the perceptions and attitudes of parents regarding massage as a culturally acceptable form of intervention to improve the outcomes for their stable preterm infants?	1: Coherence and sense-making= understanding massage in order to promote or inhibit the routine embedding in NICU	*D (mother): "yes it is in our culture, all parents do massage while bathing their baby". (P19, FG 10)* *E (mother)"The film is good you learn from it, but I fear touching my baby (FG 8, P3)* *Ha (Father): "practically, according to me, it is an easy thing….normal; can be done" (P4. FG 8)* *M: "we know the massage idea from a long time ago" (FG 12, P 17)*
2. Facilitators for application of infant massage in NICU	2.1 Cultural factors: Existing practice Perception of parents' role in NICU as a human right and touch as a need Perceived physical, psychological and relational benefits (baby, mother….) 2.2 Contextual: Positive and helping staff Assistance and support from nurses 2.3 Organizational factors: Trust in the nursing team Committed parents	Type of hospital Social and Cultural issues Parent education and experience Staff cooperation and commitment Caring and supportive environment Staff training Health care facility Practical issues and resources	What are the cultural, contextual and organisational processes that might hinder or facilitate the application of infant massage in NICU?	2: Cognitive participation=ensuring that other participants believe it is right for them to be involved, and that they can make a valid contribution to it. Participants need to collectively define the actions and procedures needed to sustain a practice and to stay involved And 3: Collective action= the knowledge work that people do to build accountability and maintain confidence in a set of practices and in each other as they use them. Who	J&K *(Father and mother)*: "*they used to do for us like this from a long time ago"* (FG 9, P3) *Az: the baby feels that this is his mother; he will have a right feeling…. when the mother puts her baby on her lap, he smells her odor. Because the baby was in his mother's womb… he senses that this is his mother, so he relaxes and gets closer to her and he feels sleepy (FG 11, P16)* *Na (mother): it is as he is relaxed and sleeping. It makes the baby's body more flexible…(FG 12, P7)* *Di (mother): "when I put my hand on my baby girl's hand, she catches it and she strains on it, she knows, I mean, she feels my presence" (FG 12, P7)*
3. Barriers for application of	3.1 Cultural: Fear of touching the small and	Myths, customs, and stories about massage			*J & K: "…Parents are afraid to touch their premature baby. They*

infant massage in NICU	fragile premature infant and fear from NICU Risk of massage and safety issues Unfamiliar act Parents' passive role in NICU 3.2 Contextual: Staff work overload and nurses' time constraint NICU physical structure and restricted visiting hours 3.3.Organizational Having other children at home Type of work of parents and economic barriers Distance and transportation issue Mothers' physical condition	Massage increases the workload of nurses Unsupportive staff and staff resistance to change Parents' characteristics, time constraint, openness and adoption of innovation Delivery mode: C/S, pain…		gets to do the work? Resource work - managing a set of practices through the allocation of different kinds of resources and the execution of protocols, policies and procedures	*have fears that he is very small". (FG 9, P5).* *A (mother):"I only stand beside the incubator. Nobody encourages me to touch or hold my babies" (FG11, P9)* *Ri: I am afraid that the baby gets used to it, what shall I do? I don't always have time to do this for him,…maybe he got used to massage, he always wants massage…Maybe because now we have twins tormenting us, they cry, they might demand us to do massage for them.(FG 9, P4)*
4.Strategies to enhance implementation as perceived by parents	4.1 Cultural: Role determination of parents in NICU 4.2 Contextual: Feasibility of massage application Easy entry and flexible visiting hours Space availability Caring and supportive approach of HCPs	Parents and hospital staff values, rituals, assumptions and expectations Flexible visiting hours for the family Hospital characteristics including size, BFHI, area, customer profiles, level of education of HCPs	How is the interplay between the cultural and contextual factors that might influence future implementation processes of infant massage in Lebanese NICUs?	NPT construct 4: Reflexive monitoring= seek to determine how effective and useful it is for them and for others, and this involves the work of collecting information in a variety of ways. Participants work together - sometimes in formal collaboratives, sometimes in informal groups to evaluate the worth of a set of practices	*J (F): all that it requires is one course from a nurse who may take half an hour, and may add it as a charge on the bill… (FG 9, P22)* *J (F): the doctor can make massage as routine application; I mean you need a doctor order who tells the parents: "you should go to caress your babies every day". As they feed the babies to grow, the caress makes the babies grow. (FG 9, P21)*
5. General consideration about the care of infant in NCU as perceived by parents	5.1 Fear and emotional stress of having a premature baby in NICU 5.2 Fear from the NICU	First experience Parents' profile Anxieties leaving their infants in NICU and not being able to hold and touch their babies			*J: Although I trust nurses but I don't know what the nurse would do with my baby in my absence. I am afraid because the baby is fragile. The fact that the baby was born premature is already a stressful event to me and my wife.*

	unknown environment				*(FG 9, P12).*
6. Suggestions for practice	6.1 Involvement of parents in routine care 6.2 Structured education program for parents about infant care	Trained experienced, supportive and dedicated staff			*So (father): "I want to enter and be able to touch him, carry him and put him in a certain place inside a specialized section for this matter"(FG 10, P15)* *So: … Yes, they (nurses, staff…) should call the mother before she leaves to teach her how to bath the baby, how to feed…, what is the type of milk needed etc… (FG 10, P24).*

Appendix 34: Publications and Conference Presentations Related to this Study

Publications:

Badr, L. K., **Abdallah, B.,** & Kahale, L. (2015). A Meta-Analysis of Preterm Infant Massage: An Ancient Practice With Contemporary Applications. *MCN. The American journal of maternal child nursing*.

Abdallah, B., Badr, L. K., & Hawwari, M. (2013). The efficacy of massage on short and long-term outcomes in preterm infants. *Infant Behavior and Development*, *36*(4), 662-669.

Oral Presentations:

Abdallah, B. November, 2016. *Exploring the cultural, contextual and organizational processes that might affect the implementation of infant massage in the Lebanese NICU environment* at the Symposium « Research and Innovation in Health » 2nd International Congress hosted by the Faculty of Nursing Sciences, University of Saint Joseph, Lebanon: «Nursing at the heart of the Health System », in partnership with the Chair of Research Nursing Sciences, Paris.

Abdallah, B. November, 2016. *Exploring cultural, contextual and organizational processes that might affect the implementation of massage in the Lebanese Neonatal Intensive Care Unit (NICU) environment* for a Postgrad student symposium, VLOG for the student conference that was held in Scotland, U.K.

Abdallah, B. August, 2015. *Exploring the Cultural, Contextual and Organisational Processes Affecting the Implementation of Infant Massage in the Lebanese Neonatal Intensive Care Unit* at the UOD MIRU monthly research meeting. the findings of the qualitative research conducted with parents

Abdallah, B. February 2015. *Improving the Research Environment* and *Evidence Synthesis*. Presented a 5 minute video "Vlog" as part of the research symposium that was organized by the school of nursing and health sciences with the School of Dentistry at UOD in Crief, UK. The presentation discussed the challenges and tips to conduct a systematic review and lessons learned in conducting an integrative review on infant massage.

Abdallah, B. July 2011. *Scoping systematic reviews to evaluate outcomes of massage intervention on preterm and/or low birth weight infants* Presented within the research seminars at FHS-UOB, Beirut, Lebanon.

Abdallah, B. May, 2011. *Scoping Systematic Reviews to Evaluate Outcomes of Massage Intervention on Preterm and/or Low Birth Weight Infants* at the first International Nursing Conference organized by the Order of Nurses in Lebanon, Beirut, Lebanon.

Abdallah, B. May, 2011. *Determinants of Premature Infant Pain Responses to Heel Sticks* at the International Nursing Conference organized by the Order of Nurses in Lebanon. International Conference organized by the Order of Nurses in Lebanon and repeated for the Research Seminars at the Faculty of Health Sciences, University of Balamand, Lebanon.